The Network provides new ways of thinking and cooperation in the field of Information Systems (IS). The Network was founded in 2004 at the University of Münster and is funded by the German State of North Rhine-Westphalia and the University of Münster.

The Network provides new ways of thinking and research in the field of Information Systems – is an international network of scientists conducting collaborative research, which makes it a vibrant and active in the IS research field. ERCIS involves numerous internationally renowned researchers from more than 20 institutions, as well as members of the Advisory Board coming from diverse industry companies. ERCIS is notable for excellent communication and exchange of information between researchers and practice.

ERCIS is for excellent communication and uncomplicated initiation of research cooperation and research projects. Among ERCIS’ associated major strengths are the personal contacts between researchers, which make it a vibrant network. ERCIS covers a wide range of disciplines associated with IS and perspectives on IS research.

Finally, students and young researchers also benefit from collaboration at ERCIS, as many ERCIS research partners offer exchange programs that last one or two semesters, which gives students an opportunity to acquire international experience. Joint lectures and guest talks organised by several ERCIS members contribute to the internationalisation of teaching.

If you are interested in connecting with the Network, please feel free to contact us! For further information please visit www.ercis.org.

DEAR FELLOW ERCIS PARTNERS AND INTERESTED READERS OF THIS REPORT, 2021 – basically our second Covid-19 year! We continued working from home, organizing research as well as teaching mostly virtual. In Münster, we just started going back to University and teaching “live” in our lecture halls in the winter semester, starting in October. I must say that I really missed that and that I totally enjoy seeing students in front of me and not just as “tiles” in my Zoom window.

However, while getting used to the “new normal”, we still had a lot going on in our network this year. As our Annual Workshop, again, could no take place in presence, we had another online meeting in September this year, where we could at least see each other virtually and talk about and discuss recent developments in the network. The biggest change was certainly the development of our five research clusters, namely (1) Data Science and AI, (2) Process Science, (3) Knowledge and Learning, (4) Smart Manufacturing, (5) Digital Public Services. The clusters were established to enhance the cooperation in the respective research areas. They span from method-orientation to domain-orientation, providing homes to the members’ various research interests and serve as incubators for project proposals, joint research and teaching activities, and joint policy-making in the respective areas. I am curious to see how the clusters develop and take up their work in the next months.

In addition to the clusters, we also joint forces with the Confederation of Laboratories for Artificial Intelligence Research in Europe (CLAIRE), an organisation created by the European AI community that seeks to strengthen European excellence in AI research and innovation. As several ERCIS partners were already founding members of CLAIRE, I think that this collaboration is an excellent add-on to our research cluster Data Science and AI.

As we really want to strengthen collaborations within the clusters, it was clear to us, that we also wanted to discuss them with our advisory board in the context of our virtual advisory board meeting in November. We discussed e.g. the opportunities for the companies to participate in the work of the clusters and to stay informed via our newly established communication platform Mattermost. During the advisory board meeting we could also welcome two new companies in the advisory board, namely Flaschenpost and LVM. Great to have you on board!

Furthermore, we also had personnel changes at our headquarters in Münster. Martin Dugas moved to Heidelberg to head the new Institute for Medical Informatics at the University Hospital there. We wish him a very good start and he will stay part of the network as personal member. His successor as ERCIS director is Julian Varghese and we are happy to have him with us to keep the perspective of medical informatics in the headquarters. We could also welcome a new second member to the board of directors, Tobias Brandt, this year. He moved to Münster in July to take up the professorship “Public Sector Digitalization” at our Department of Information Systems in Münster. Great to have you both with us!

For 2022 I hope that we will be able to meet again in presence. Please, save the date for the ERCIS Annual Workshop: On 12 September, the Annual Workshop will take place in Münster just before the 20th BPM conference, which we will host in our beautiful Münster castle! Let’s keep our fingers crossed that we will all meet again there – I am very much looking forward to it!

All the best and stay healthy,

Jörg Becker
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The 2021 Annual Workshop in September was, again, virtual. This obviously limits the opportunities for personal exchange, but has the advantage of many partners being present. 84 participants joined the meeting, discussing the current and future state of the network.

The task given to the headquarters last year – to further define the research clusters and put them to life – has been accomplished, which made their presentation one of the most prominent elements of the workshop.

By assigning “cluster leads” from various member institutions, the network organization becomes more decentralized. This results in specific goals of the respective clusters which have not been defined by the headquarters, but by the network members themselves.

For the next year, we envision activities among the cluster participants, like workshops, joint tracks at conferences, joint paper projects, joint seminars, etc. The cluster leads provided already first insights into their plans – we are excited to see where this journey will take us!

Directly related to the research cluster presentation was a discussion about the role of the ERCIS competence centers. General consensus was that both, the competence centers and the research clusters will continue to co-exists, with the competence centers being more fast-moving and specific, and the clusters being more general and robust. Presentations of all of our seven competences demonstrated the dedication of their members.

A second major move in 2021 was the establishment of Mattermost as communication platform for all members of the network. Earlier, communication was directed at the institutional representatives, whom we trusted to forward information to their colleagues and PhD students. With this new Slack-like platform, the network offers a low entry barrier for everyone, and interest-driven channels. Naturally, we provide specific channels for the clusters, for joint teaching activities like seminars, or for joint research endeavors. Giving members the permission to create their own teams and channels, we hope to establish Mattermost as well-accepted communication means!

Finally, we were delighted to invite the network to Münster in 2022: As the Department of Information Systems of the University of Münster, or more specifically, Prof. Jörg Becker, was asked to host the 20th International Conference on Business Process Management (BPM 2022), we used the opportunity to connect the two events! The ERCIS Annual Workshop will take place September 12th, so please save the date! We also hope to finally move to Wrocław in 2023 – let’s keep fingers crossed!
RESEARCH CLUSTER

In 2021, the ERCIS network defined five network clusters that serve as umbrella for its members to join forces. They span from method-orientation to domain-orientation, providing homes to the members’ various research interests. They serve as incubators for project proposals, joint research and teaching activities, and joint policy-making in the respective areas.
In our networked world, data is collected in ways never seen before. Extracting knowledge from this data and leveraging it to build intelligent systems will transform the way business, government, and science are carried out. Many people believe that data science and AI will bring forth changes that will be much more profound than any other technological revolution in human history.

Digital services can adapt to individual humans and situations due to the abundance of data and the improved capabilities to learn from this data. Big steps are made in many scientific areas these times, notably in natural language processing, image recognition, and in finding complex synthesis ways, e.g. for novel drugs and materials.

However, there are also risks associated with algorithmic decision making and autonomous AI systems. They may be used for steering very complex hacking activities, or autonomous weapon systems, or simply decide wrongly according to unknown biases in the data.

In Information Systems, humans and their interaction with technology are traditionally an important topic, and this angle is of specific relevance for enabling real-world use of Data Science and Artificial Intelligence methods, beyond pure algorithmic research. Especially when security aspects or ethical problems of these methods are under consideration, this viewpoint is highly significant.

The mission of the ERCIS “Data Science & AI” cluster is to advance research, education, and practice on human-centered data science and AI in order to augment human capabilities and improve societal well-being. We explicitly take a socio-technical perspective on data science & AI, focusing at the intersection of technologies, humans, and tasks.

As next steps, we intend to perform a cluster member survey in order to provide insight into the multiple interests of the members and their priorities, and we want to organize a half day cluster focused workshop during the ERCIS annual meeting.

The cluster data science and artificial intelligence is headed by:
- Oliver Müller is Professor of Management Information Systems and Data Analytics at Paderborn University. His research interests focus on data-driven judgment and decision making. This includes the design and use of machine learning solutions for supporting human judgment and decision making, with a special focus on the computational analysis of unstructured data (e.g., texts, images), as well as studying the acceptance and implications of data-driven decision making in organizations.
- Mike Prèuss is assistant professor at LIACS, the Computer Science department of Leiden University. He works in AI, namely game AI, natural computing, and social media computing. He is well known for his works in evolutionary optimization, experimental methodology, and the pioneering drug discovery by means of an AlphaGo inspired method.
Members of the Digital Public Services cluster meet at least three times a year to discuss relevant topics and research cooperation ideas. Networking opportunities within the cluster are highly encouraged, especially for Ph.D. students and junior researchers. Participants also agreed to organize joint networking activities, including the ‘brown bag lunch’ and the Kilpisjärvi Information Systems seminar. The cluster on Digital Public Services encourages all its members to participate in creating an informal collaborative atmosphere and continue exchanging interesting and relevant research ideas in the field of digital public services.

Currently, the cluster on Digital Public Services involves 44 individual researchers related to 24 academic institutions. To kick-off, the digital Public Services cluster organized an online kick-off workshop on 30 September 2021 and gathered ERCIS members interested in the topic of eGovernment. During the workshop, participants discussed and identified the main research trends, key-meeting points, and ongoing projects in smart cities, social media, and e-government in general. Furthermore, members of the Digital Public Services agreed, inter alia, to collaborate and contribute to the track development of the leading conference in the field of e-government, including dg.o 2022 at Seoul National University, South Korea, and dg.o 2023 at the University of Tartu, Estonia.

NEXT KEY ACTIVITIES

- The meetings of the cluster on Digital Public Services will be on 25–26.08.2022 and 27.01.2023.
- The Cluster will work on preparing a track for dg.o.2022 and dg.o.2023.
- Present at the teachingpublicservices.digital initiative.
- Kilpisjärvi Information Systems seminar (Kilpisjärvi, Finland 26.03.–02.04.2022)
- Well-being in the Information Society conference (Turku, Finland 24.–26.08.2022)

Digital Public Services cluster is lead by Prof. Robert Krimmer (University of Tartu) and Prof. Reima Suomi (University of Turku).

The ERCIS Cluster in Knowledge and Learning (K&L) encompasses a broad range of academic interests. It has been presented as comprising “everything related to Knowledge Management, Teaching, Learning, Education, and the likes”. For this reason, when clusters were initially presented, the K&L cluster was “put in between the other four clusters”. For similar reasons, when ERCIS “members” were asked to assign their research interests to clusters, every single member included the K&L cluster.

The K&L cluster is, therefore, a special case among ERCIS clusters. It can be a challenge to find a way for the K&L cluster to create value to the ERCIS community. Considering that the role of clusters is open to definition, to differentiation and to evolution, it makes sense to start with caution. This means avoiding defining a vision for the cluster that is too strict or that is biased towards particular perspectives of what knowledge and learning means to the ERCIS community.

So, the initial vision for the K&L cluster is to serve as a “rose of the winds” for those that navigate in the knowledge and learning ocean. With knowledge and learning in its centre, the “rose of the winds” will indicate the different directions where the academic exploration of those topics can lead to.

Furthermore, the vision of this cluster is to become a knowledge-sharing space where participants come together to learn from one another face-to-face and/or virtually. We see the clusters as a promoter of informal undertakings that demand some coordination, facilitation, cultivation, and nurturing. Members in the cluster will decide on specific topics that are timely to address and which will relate to the research interests of the members.

WHAT ACTIVITIES WOULD WE LIKE TO INITIATE IN OUR CLUSTER?

- Mapping of research interests
  The first activity of the K&M cluster will involve the creation of a map of academic interests anchored in knowledge and learning. This map will depict the wide range of possible academic interests that, somehow, are related to knowledge and learning. The creation of the map will be carried out collaboratively, involving as much as possible the ERCIS community. The endeavor will involve activities that promote creativity in a collaborative way such as a knowledge café.

Initially, the map will be created by doing the following exercise among the participants:

Why do you think the K&L cluster is relevant for you?

- I teach knowledge management topics
- I do research in knowledge management
- I teach and teaching involves conveying knowledge of some kind.
- I teach and I expect my students to learn
- I do research on topics related to organizational/enterprise learning
- I teach topics related to organizational/enterprise learning
- I do research, so I create knowledge
- Information systems involves information, often, information correspond to representations of knowledge

I am involved in IS professional practice, such practices involve knowledge
I am a member of a community-of-practice, the way it works triggered my interest in knowledge and knowledge management.
I act as knowledge broker in my institution
I have academic interests in AI; therefore, I am concerned with knowledge and with learning
I participate in the design of courses and degree programs; they involve knowledge and learning
Expanding knowledge
We would like to encourage cluster members to organize mini tracks in selected conferences focusing on topics related to K&L that can contribute to the establishment of an encompassing view of K&L in information systems research.

Connecting to other ERCIS clusters
Activities that aim at creating links between the other ERCIS clusters. Members act as knowledge brokers and aim to stimulate boundary-crossing activities with clusters that explore common interests.

Cluster leads contact info:
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Three reasons lead to the establishment of the ERCIS Cluster:

1. Increasing availability of data, computer science, management science, and organizational design, with a focus on various aspects of digital innovation and transformation as well as the management of collaboration in a digital world.

2. The world is increasingly changing, and the study of processes helps us understand the changing demands and conditions in the factory, supply chain, and customers’ needs. Digital technologies such as the Internet of Things (IoT), sensors, cloud computing, and big data analytics have tremendously influenced the production systems of manufacturing firms over the last years and continue to do so as part of the ongoing fourth industrial revolution. Production sites with digitally enhanced machines and assets (smart products) become connected and automated, and they generate and exchange data through the IoT. Actors in the wider supply chain can use this data to fine tune the management of the supply chain to offer novel data-driven service that complement existing products, transforming supply chains into service ecosystems.

3. Finally, the digital transformation in manufacturing leads to completely new ways of providing customer value with customized and outcome-based solutions instead of traditional product sales.

Please check Process Science: The Interdisciplinary Study of Continuous Change for the Process Science Idea, a paper authored by ten significant researchers on the topic!

The following figure depicts a core summary of Process Science. At the core of process science is the study of processes (focus). It aims to describe, explain and intervene in processes (objective). Thereby, it embraces an interdisciplinary viewpoint, integrating contributions from various disciplines (perspective).

The concept of smart manufacturing refers to fully integrated and collaborative manufacturing systems that respond in real-time to meet the changing demands and conditions in the factory, supply chain, and customers’ needs. Digital technologies such as the Internet of Things (IoT), sensors, cloud computing, and big data analytics have tremendously influenced the production systems of manufacturing firms over the last years and continue to do so as part of the ongoing fourth industrial revolution. Production sites with digitally enhanced machines and assets (smart products) become connected and automated, and they generate and exchange data through the IoT. Actors in the wider supply chain can use this data to fine tune the management of the supply chain and offer novel data-driven service that complement existing products, transforming supply chains into service ecosystems.

In our cluster, we will organize regular meetings to discuss the transformation of manufacturing firms through digitalization (e.g., at the next ERCIS annual meeting plus additional video meetings). We are also looking forward to joint research/publication projects on smart manufacturing topics (e.g., industrial internet of things, digital platforms in manufacturing, retrofitting, smart services, digital servitization, digital workplaces, supply chain management). Future joint activities can also include the exploration of funding opportunities for joint research projects, the organization of conference tracks and journal special issues as well as the exchange of PhD students within the ERCIS network.
The ERCIS headquarters is located in Münster, Germany. All full professors of the department of information systems at the University of Münster serve in the board of the network and are active in the fields of information systems, computer science, data science, supply chain management, medical informatics, and law. Additionally, the management team at the headquarters works with the board to organise regular meetings, joint teaching endeavours, and research proposals with the network partners.
Smart Cities is the field of research that uses the advances in information and communication technologies to increase the operational efficiency, information sharing, and quality of services of the four constituent areas of a city: retail, government, mobility, and energy. A focal topic is the development of integrated and configurable reference models these areas, in order to advance the scientific knowledge and yield practical value for the creation of smart cities. Further important topics are the theory of the citizens’ digital sovereignty and its consideration and integration within these reference models.

**SELECTED CURRENT RESEARCH PROJECTS**

**eGovCAMPUS**

The project eGovCampus targets the development of a massive open online courses (MOOC)-platform, which will help to facilitate the development of the digitalization of the public sector in Germany. The main objective of both platform and project is to provide public officials with an educational offer, that enables them to develop their skills in a location-independent, interactive and self-responsible fashion. The Chair for Information Systems is responsible for the project coordination. This firstly entails the conception and development of the platform, which includes the establishment and analysis of stakeholder requirements. Furthermore, activities are targeted to ensure the platform’s sustainable impact, closely related future-proof business models and appropriate marketing efforts to ensure the existence of the platform even beyond the period of public financing.

For further information, please visit: [https://egov-campus.org](https://egov-campus.org)

**AWARDS**

Jörg Becker, Bettina Distel, Marco Niemann, and Sebastian Halsbenning were awarded for the Most Innovative Paper Award for their article “Playing (Government) Seriously: Design Principles for E-Government Simulation Game Platforms” at the 16th International Conference on Business & Information Systems Engineering (WISE) 2021.


**SELECTED PUBLICATIONS**

Please see [https://www.uni-muenster.de/departments/groups/is/publications](https://www.uni-muenster.de/departments/groups/is/publications) for a complete list of publications.


## CONTACT DETAILS

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**DISSERTATIONS**

Barann, Benjamin: Orchestrating E-Service Touchpoints in Brick-and-Mortar Retail


Heuchert, Markus: Event Information Systems – A Process and Data Reference Model for Event Management

von Lajewski, Lasse: E-Commerce und Verbindungsgrenzen – Strukturierung von Konzepten und Unterstützung bei der Auswahl
This is the case, for instance, in remote sensing, where satellites produce data volumes in the petabyte range per year. A similar “data flood” can be observed in many other disciplines as well, including medicine, social media, finance, or in the context of modern energy systems. In most cases, the sheer data volume renders a manual analysis impossible, which necessitates the use of automatic data analysis tools.

Machine learning techniques aim at automatically extracting knowledge and have been identified as one of the key drivers for discoveries and innovation both in remote sensing and smart cities. The project aims at developing high-efficient parallel implementations for AI methods that allow to detect and monitor changes visible in time series satellite data. The project is supported by the Independent Research Fund Denmark (DFF) and is conducted in close collaboration with experts from the University of Copenhagen.

Deep Learning for Accurate Quantification of Carbon Stocks (DeepCrop)

Recent technological developments in deep learning and drone-borne LiDAR scanners have paved the way for constraining the uncertainty inherent to quantify and project ecosystems’ carbon stocks. With a rising demand for biomass, DeepCrop aims to precisely measure the so-called above ground biomass and to estimate carbon sinks in croplands and forests. The ambition is to bridge expertise of experimental scientists and computer scientists to develop novel tools for the automated processing of LiDAR data utilizing deep learning and drones. The project is conducted in collaboration with the University of Copenhagen and is supported by the Vilum Foundation and the Data+ program of the University of Copenhagen.

Automatic Information Extraction

Structured, machine-readable information is a key input to digital business processes. Yet, this information is often hidden in unstructured business documents. In this project, we develop AI-based methods for automatic information extraction from these documents. In contrast to traditional approaches, which rely on, e.g., prescribed rule sets or hand-crafted layout templates, we develop AI models that parse information items from generic (even unseen) document layouts. To this end, we leverage recent advances in both natural language processing and graph neural networks. The resulting model architectures are trained and tested on tens of thousands of annotated documents. The project is a joint collaboration between Münster University of Applied Science, University of Münster, and dvelop, a leading provider of content services platforms.

Publications


The group’s research activities can be divided into three main research areas, namely Supply Chain Digitalisation, Supply Chain Integration, and Supply Chain Security and Crisis Management.

Within the research area of Supply Chain Digitalisation, the chair addresses the challenges of digitalising supply chains and investigates how organisations can exploit arising opportunities. To achieve this, the chair conducts research on topics such as digital maturity evaluation, production planning within Industrie 4.0, predictive maintenance, and data analytics-driven performance measurement. In addition, we research how supply chain digitalisation can be facilitated through the means of computational intelligence and supply chain analytics.

The research area of Supply Chain Integration focuses on the cross-functional integration within a company and along the company’s supply chain. Supply Chain Integration is deemed inevitable for business success and achieving sustainable competitive advantage. Hence, the group investigates and extends state-of-the-art solutions like Sales&Operations Planning (S&OP) and develops concepts to facilitate their efficient industrial applications. This includes the application of methods from enterprise architecture management and the usage of business analytics, among others.

The third research area Supply Chain Security and Crisis Management addresses challenges in uncertain and unsteady environments exposed to disruptive events. Our research activities are dedicated to understanding the use of IS to ensure a rigorous and relevant solution design and evaluation. The goal is to provide reference models and procedures to assess current and future scenarios by means of modelling, visualisation, analysis, and simulation. Research topics within this group currently encompass blood supply chain management, decision support systems for epidemics prevention, and the design and evaluation of humanitarian IS, among others.

**RESEARCH PROJECTS**

- In the BMBF-funded project BISKIT, we provide a simulation-based toolkit and enterprise architecture-based models to improve the crisis resilience of the South African blood supply chain. Thereby, we aim to ensure that the limited resource “blood” is efficiently distributed in times of crises. In various stakeholder workshops, participants from all over the world showed great interest in our results, underlining the importance of this work.

- In the Horizon 2020 funded project STAMINA, we provide methodological support to more than 32 trial events on pandemic management innovations. Each of the trials addresses distinct practitioner interests in the management of pandemic outbreaks. For that, innovative solutions are trialed according to a rigorous and robust evaluation approach in realistic scenarios executed jointly by practitioners, researchers, and solution providers.

- In the BMBF-funded EpidPredict and CoPredict projects, we are using simulation-based IS to understand the interaction of non-pharmaceutical interventions and infectious disease outbreaks with a distinct focus on the ongoing SARS-CoV-2 pandemic. Partnering up with members of the German SARS-CoV-2 Modelling Initiative, we will utilise the software to provide regular forecasts in our new DFG-funded project Spacelimit where we will use spatial mobility and contact data to achieve more regionally granular forecasts.

- Within a DAAD and CAPES-funded PROBRAIL project, the chair closely collaborates with researchers from the Pontifical Catholic University (PUC) in Rio de Janeiro, Brazil, and addresses various issues within the field of S&OP. Current work focuses on guiding the successful implementation and transformation of S&OP processes, e.g. by integrating data analytics, sustainability, and risk management.

- In collaboration with researchers from PUC and the Global Manufacturing Research Group (GMRG), the chair investigates the digital transformation of supply chains. An ongoing international survey is covering topics like sustainability and supply chain digitalisation. The chair gives conceptual input and plans to support the data collection.

**EVENTS**

- In February, PUC hosted the International Joint Conference on Industrial Engineering and Operations Management. In collaboration with Prof. Márcio Antonio Thomé and Prof. Luiz Felipe Scavarda, the chair shared current research in the areas of analytics-driven S&OP, S&OP’s impact on sustainability, and maturity of digital supply chains.

- During the 31st Annual Conference of the Production and Operations Management Society in April, Bernd Hellingrath and Adam Widera chaired the session “Applications of Simulation in Humanitarian Logistics”. This session aimed at providing a structured overview of the application of simulation in humanitarian logistics research and its potential to enhance humanitarian logistics practices.

- Together with the Main School of Fire Service in Warsaw, Poland, the chair and the Competence Center for Crisis Management (CM) co-organised the first two International Scientific Conferences on Evaluation Mechanisms in Crisis Management (CM).

- While the first edition in April covered the topic of how CM exercises can be evaluated, the second edition in June dealt with the assessment of CM innovations.

- Under the title “Logistics for a Sustainable Future – Contributions from Science”, the 10th International Scientific Symposium on Logistics took place in June this year. As a member of the programme committee, Bernd Hellingrath was responsible for the symposium’s success. The chair contributed by sharing current research findings on the application of supply chain analytics and its industrial adoption.

**PUBLICATIONS**


**DISSERTATIONS**

The ITM is the leading Institute for Information Law for North Rhine-Westphalia. The Institute explores the legal framework and underlying issues about the institution and its operation with the Faculty of Economics of the University of Münster. Many activities are carried out in close cooperation with the Faculty of Economics of the University of Münster. In 2002, the ITM was appointed as Competence Centre in Telecommunication Law and related areas such as Copyright, Platform Regulation or E-Commerce, and Consumer Protection Law. Our current projects address the emerging subjects of Artificial Intelligence Law and Algorithms, Data Protection Law, or the Future of Legal Professions and Institutions. Since Information, Telecommunication and Media Law is characterised as a cross-sectional matter, it cannot be fully covered by any of the traditional legal disciplines by itself. The ITM, therefore, strives for interdisciplinary research and teaching activities.

**Research Topics**

Our research focuses on Information Law, Telecommunication Law and Media Law, and related areas such as Copyright, Platform Regulation or E-Commerce, and Consumer Protection Law. Our current projects address the emerging subjects of Artificial Intelligence Law and Algorithms, Data Protection Law, or the Future of Legal Professions and Institutions. Since Information, Telecommunication and Media Law is characterised as a cross-sectional matter, it cannot be fully covered by any of the traditional legal disciplines by itself. The ITM, therefore, strives for interdisciplinary research and teaching activities.

**Current Research Projects**

Currently, the ITM is involved in several EU-funded and national projects:

- **GOAL**: The GOAL (“Governance of and by Algorithms”) Project is an interdisciplinairy project funded by the Federal Ministry of Education and Research. The project partners are the University of Münster, University of Kaiserslautern, Karlsruhe Institute for Technology (KIT), Ruhr-University Bochum (RUB) and University of Hamburg. The GOAL-Project deals inter alia with the issues of algorithmic behaviour control and artificial intelligence. The aim of the project is to identify governmental, technical and regulatory requirements and options for the design of comprehensive governance structures.

- **Research Center for Industrial Property Rights**: The ITM also hosts the Research Center for Industrial Property Rights, which offers training and conducts research activities in the field of Industrial Property Rights trying to connect science and economics. The Research Center is supported by an association of companies, lawyers and patent attorneys.

- **Art Law Clinic**: A project is in cooperation with the Academy of Fine Arts Münster. Its basic idea is: “Law students for art students”. Art students can seek the help of law students in senior classes to solve their fundamental legal problems, which occur during their academic studies. The service is entirely free and coordinated by employees from the ITM and the Academy of Fine Arts Münster. Additionally, a legal guideline has been provided, giving students an entry point and further information on the topic of art law. By combining the inherently different but closely connected topics of law and art, the project will increase the interdisciplinary and mutual understanding between law students and art students and their respective subjects.

- **Matters of Law in the German Research Network (DFN)**: The German Research Network (Deutsches Forschungsnetz/DFN) provides a communication network for universities and research facilities in Germany that not only connects them with one another but also with the community of research and education networks worldwide. Increasingly, the DFN-members are facing legal questions regarding liability, telecommunications, and data protection. The ITM assists in solving those challenging issues and offers general legal advice to the members.

- **Legal Information Office DFN.NRW**: The Legal Information Office DFN.NRW (Rights-informationstelle DFN.NRW) is in a contact point for all those involved and interested in e-learning and digital teaching. In May 2020, it was established under the organizational umbrella of the Digital University of North Rhine-Westphalia today is located at the Institute for Information, Telecommunication and Media Law (ITM). Since then, the Office has provided teachers and students legal guidance concerning e-learning and teaching and continues to do so. The main focus lies on data protection law, copyright law and examination law.

- **FAIR Data Spaces**: FAIR Data Spaces is an interdisciplinary project funded by the Federal Ministry of Education and Research. Along with the University of Münster, the project partners comprise the Institute for Information, Telecommunication and Media Law (ITM). It aims to deal with the organizational and mutual understanding between the ITM and the Academy of Fine Arts Münster. Additionally, a legal guideline has been provided, giving students an entry point and further information on the topic of art law. By combining the inherently different but closely connected topics of law and art, the project will increase the interdisciplinary and mutual understanding between law students and art students and their respective subjects.

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The historical examination of drug prescriptions in an interdisciplinary context shows that its social significance goes beyond that of a request to dispense a drug. The collaboration partners aim at revealing the social innovations and design decisions of the past inscribed in the drug prescription. Because of its unique identifiability over time, the prescription offers a unique way to bear witness to the health policy, economic, information technology, and medical innovations of the time and to provide food for thought for the future health care information infrastructure.

Digital Transformation and the Role of Innovation

The project examines the role of organisational innovation in strategic decision-making processes. In particular, we are interested in exploring how organisational improvisation practices affect the digital transformation process and how companies can build improvisational capabilities that support their digital transformation journey.

Contract Design for Short-Term Software Development Outsourcing: An Empirically Supported Economic Analysis

Ms. Gaebert’s paper-based PhD thesis applies New Institutional Economics as conceptual frame and a multi-method research design to explore “Short-Term Software Development Outsourcing” (stSDO). The thesis addresses two research goals:

1. To understand the distinctive properties of stSDO and

2. To find the appropriate contract type for stSDO to protect the parties’ investments and to motivate and incentivise the parties to contribute to the project in a constructive manner.

She combines conceptual and empirical work based on 25 years of experience as a vendor in software development projects in Germany. The empirical papers aim at classification (e.g., forms of contracts), while the conceptual work is partly explanatory and partly normative.

Development of Digital Platforms in Health Care

(Pers. S. Klein, in collaboration with FU Berlin)

Multi-sided platforms in healthcare often focus their business model on standardising care for wide spread, chronic diseases. However, there is a lack of knowledge on platform business models enabling individualised care coordination for patients with rare diseases. This project analyses the development of a complex platform business model addressing Amyotrophic Lateral Sclerosis, a severe neurological disease that requires the coordination of a diverse network of medical specialists, care, and equipment providers. A longitudinal case study examines the platform's development, focusing subsequently on qualitative and efficient care coordination, care research, and active and direct involvement of patients, as well as establishing two business models, namely, care coordination and care research. We reconstruct how these complex platform business models were configured to improve patient care and care research, thereby creating immediate value for patients and insights for long-term care improvements. The ongoing platform development currently balances value generation for diverse stakeholders and economic sustainability.
1997. He teaches in the area of software engineering, methodologies, and programming. Maintaining close collaborations with several local companies, his group is offering students the chance to write bachelor and master theses with high practical relevance.

RESEARCH TOPICS

The research of the group focuses on selected aspects of Software Engineering and Programming. Fields of research are Testing, Model-Driven Software Development, Domain-Specific Languages, Process-Driven Applications, the Integration of Programming Paradigms, Parallel and Distributed Programming, Swarm Intelligence Algorithms, and Machine Learning.

CURRENT RESEARCH PROJECTS

We work on different applications of Model-Driven Software Development techniques within various fields. First, based on our Domain-Specific Language modAL, we introduced a model-driven approach to customising the ERP system Microsoft Dynamics 365 Business Central. We plan to expand this work in collaboration with best practice consulting AG to extend development in SAP ERP. Second, there is ongoing research in cooperation with the Institute of Medical Informatics to ease the analysis of clinical study data. Lastly, we collaborate with the research group for Clinical Biomechanics at the Institute of Sport and Exercise Sciences to develop an application supporting the collection of study data during sports injury rehabilitation.

The research on Parallel Programming focuses on high-level frameworks based on algorithmic skeletons. It aims to minimise the expertise required to create parallel programs by abstracting, e.g. from memory allocations or the number of parallel processes started. Programs written in the framework are converted to MPI, OpenMP, or CUDA programs. For this purpose, we maintain two distinct approaches: the domain-specific language Musket and an extension to the C/C++ standard library Muesli.

The research on the Münster Logic-Imperative Language (Mulii) has progressed to support free arrays and free objects. Free arrays are arrays the size and elements of which are of symbolic nature while free objects represent objects with a free type. Both concepts allow for new formulations of constraint satisfaction problems, object graph generation, and automatic test case generation. The capabilities of Mulii justify a new performant rewrite to enable the practical applications of these concepts. We furthermore aim to dedicatedly apply the concepts of Mulii to test case generation.

Moreover, research has been done on automatically identifying data-flow relations in form of def-use chains for Java programs. This is achieved by instrumenting the Java bytecode of the program to dynamically derive the relevant information during the execution. Currently, the approach is being extended by symbolic execution to enable the detection of those data-flow relations of the program that were missed by the execution.

Within our research on Parallel Programming (Musket and Muesli) we focused on creating efficient Skeletons for stencil operations. Especially, we target multi-node, multi-CPU, and multi-GPU environments. Future research targets multi-language support, and the optimisation for non-identical-sized data structures.

Another active research area is machine learning in organic chemistry. In close cooperation with the research group of Prof. Glorious at the Organic Chemistry Institute, we are working on several projects for the application of machine learning in the field of organic chemistry. Our goal is to provide tools and methods that enable other researchers to perform their laboratory work in a more sustainable and time-efficient way. In addition, we are developing methods to represent molecules in order to better describe chemical problems. Due to close cooperation and interdisciplinary exchange, we have been able to establish ourselves in the field of molecular machine learning.

A new field of research is multimedia systems. We started to work around new approaches for video processing, delivery control systems as well as live streaming. Our work will be practiced evaluated and applied in the emerging service educast.nrw, a video platform for Universities in the state of North Rhine-Westphalia.

EVENTS

From September 29th to 30th, the 18th ACM SIGPLAN International Conference on Managed Programming Languages and Runtimes, Münster, Germany, September 29–30, ACM.


CONTACT DETAILS

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Heike Trautmann is Head of the Data Science: Statistics and Optimization group as well as a director of ERCIS. Together with Christian Grimme she leads the ERCIS Competence Center “Social Media Analytics” since 2011. She is also Adjunct Professor of Data Science in the Data Management & Biometrics Group at the University of Twente, in the Netherlands. Her team contributes to the research areas of data science, artificial intelligence, social media analytics, multi-objective optimization, computational evolution as well as automated algorithm selection and configuration in international and industrial collaborations.

**Research Topics**

Some of the most challenging real-world problems involve the systemic and simultaneous optimisation of multiple conflicting objectives. As most of those Multi-Objective Optimization problems cannot be solved exactly, we apply optimisation techniques from Evolutionary Computation to approximate optimal compromises with special focus on multimodality.

In the context of Algorithm Benchmarking, the group evaluates the performance of nature-inspired techniques and contributes to algorithm design from an empirical and classification approach, in particular deep learning with the Configuration and Selection of algorithms. Since 2021, she is also Adjunct Professor of Data Science in the Data Management & Biometrics Group at the University of Twente, in the Netherlands. Her team contributes to the research areas of data science, artificial intelligence, social media analytics, multi-objective optimization, computational evolution as well as automated algorithm selection and configuration in international and industrial collaborations.

**Wissenschafts Informatik & Statistik**

Moreover, the group is highly interested in designing automated algorithm configuration and selection strategies operating on data streams. Specifically, textual streaming data is analysed by Dennis Assenmacher, Lena Clever, Moritz Seiler, Janina Pohl, and Christian Grimm with the aim of disinformation and disinformation detection in online media (Projects DemoRESDigital, Moderate, Competence Center Social Media Analytics, Topical Program Algorithmization and Social Interaction).

**Current Research Projects**

Hybrid – Real-time detection of disinformation campaigns in online media (https://algorithmization.org/np-6490). The aim of the BMBF-funded joint project is to develop methods and tools, which enable experts to better assess disinformation campaigns. The partners from computer science, social science, journalism, and practice combine computational analysis with human expertise to detect, analyse, and classify disinformation campaigns.

DemoRESDigital (www.demosresdigital.uni-muenster.de): “Democratic resilience in times of online-propaganda, fake news, fear- and hate speech”. This junior research group is supported by the Digital Society research programme funded by the Ministry of Culture and Science of the German State of North Rhine-Westphalia. It is associated with the Department of Communication at WWU Münster and the Data Science: Statistics and Optimization Group.

Moderate (https://www.moderateur.net) The project aims to use an integrative and interdisciplinary approach to develop software tools and a web platform that will enable operators to moderate web debates with significantly less effort. Comments will be analysed automatically, so that only a small number of critical comments have to be reviewed manually.

WWU Topical Program “Algorithmization and Social Interaction” (www.algorithmization.org). The topical program is an interdisciplinary and international collaboration of researchers in computer science, information systems, management, economics, social and political sciences, law and communication science. It specifically investigates how algorithmization affects individuals and society at large.

**Algorithmization and Social Interaction**

Social Bots during German Elections (2021). The project is funded by the German Federal Ministry of the Interior and investigates current technologies for re- alising social-bot-based campaigns. Additionally, the project investigates current social bot activities by applying a new real-time topic detection mechanism, which helps in campaign detection as a prerequisite for subsequent forensic identification of automated actors.

The group strongly supports the joint European initiative CLAIRE (Confederation of Laboratories for Artificial Intelligence Research in Europe, www.claire-al.org) that seeks to strengthen European excellence in AI research and innovation. This year, the group played a key role in agreeing on a Memorandum of Understanding between CLAIRE and ERCIS.

**Selected Publications**


The integration of clinical and molecular data.

Data and bioinformatics in high-throughput sequencing in cancer research, wisdom, data, and the next-generation sequencing are used as well as latest technologies like targeted and whole-exome sequencing are used as well as latest techniques like single-cell RNA-seq and single-cell ATAC-seq to identify new subgroups, biomarkers and therapeutic options. Integrating longitudinal data characterizing a tumor, the IMI also performs analyses on clonal evolution.

The Smart Device System utilizes advanced AI-algorithms for time-series analysis of smartwatches, smartphones, tablets and advanced AI algorithms for time-series analyses for digital neurological examination of Movement Disorders. The system is being applied in the Neurology Department of the University Hospital in Münster.

The largest public portal of medical data models is managed by the IMI of Münster for research re-use. To foster interoperability of different systems the Institute applies and researches data standards, meta data standards with utilization of medical terminologies and ontologies. Clinical data analyses focuses on Machine Learning and several Deep Learning methods for clinical Decision Support utilizing medical time-series and mobile health devices.

The integration of clinical and molecular data, especially analysis of next-generation sequencing (NGS) in cancer research, is a well-established focus of the institute with national and international cooperation for many years. The rapid increase in data volumes of high-throughput sequencing in molecular medicine poses constant challenges from an informatics point of view.

The IMI is part of the nationwide Medical Informatics Initiative and established the Medical Data Integration Centre of the University of Münster to integrate primary information systems of the University Hospital in Münster for research re-use. To foster interoperability of different systems the Institute applies and researches data standards, meta data standards with utilization of medical terminologies and ontologies. Clinical data analyses focuses on machine learning and several deep learning methods for clinical decision support utilizing medical time-series and mobile health devices.

The Smart Device System utilizes smartwatches, smartphones, tablets and advanced AI algorithms for time-series analyses for digital neurological examination of movement disorders. The system is being applied in the neurology department of the University Hospital in Münster.

The IMI participates in the DFG clinical research group “Male Germ Cells: From Genes to Function” (CRU 3/6), taking care of all OMICS data analyses. The project studies male infertility by means of genomics and transcriptomics analyses, including humans as well as model organisms like zebrafish or marmoset. Well-established techniques like targeted and whole-exome sequencing are used as well as latest techniques like single-cell RNA-seq and single-cell ATAC-seq to identify new subgroups, biomarkers and therapeutic options. Integrating longitudinal data characterizing a tumor, the IMI also performs analyses on clonal evolution.

Dr. Carolin Walter: WWU PhD Award for her studies “Benchmarking of 45-Seq pipelines based on real and simulated data” to optimize bioinformatics pipelines for 45-Seq data: https://www.uni-muenster.de/news/view.php?cmdid=11411.

The largest public portal of medical data models is managed by the IMI of Münster and Heidelberg. It is a registered official European Research Infrastructure. To date it contains 24,000+ data models and 500,000+ data items with semantic annotations. (https://medical-data-models.org)

The Institute of Medical Informatics (IMI) is part of the HiGHmed Consortium, which is funded by the Federal Ministry of Education and Research. Münster is actively involved in the use case infection control. This automated early warning system will help to protect patients from new infections, but also to understand their causes and how infectious diseases spread. Moreover, the IMI provides and maintains IT-infrastructure for several large scale international observational studies. (www.highmed.org)

Biomedical Informatics

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The Institute of Medical Informatics (IMI) is part of the HiGHmed Consortium, which is funded by the Federal Ministry of Education and Research. Münster is actively involved in the use case infection control. This automated early warning system will help to protect patients from new infections, but also to understand their causes and how infectious diseases spread. Moreover, the IMI provides and maintains IT-infrastructure for several large scale international observational studies. (http://imi.uni-muenster.de)
Process mining is a relatively new technology at the intersection of Business Process Management (BPM) and Data Mining. The basic idea is to use traces of process executions supported by information systems for process analysis. Thus, it represents a reverse approach compared to process modeling and the as-is analysis of a process is based on factual event data. Process mining consists of three types. One is based on factual event data. Process Mining-software.com/) where client information is shown in a Web dashboard. The data were collected from heterogeneous online sources such as Wikidata, DBpedia, Twitter, and LinkedIn. The system architecture was developed with a big-data-driven mindset, where high volumes of structured and unstructured data must be collected, integrated, and analyzed dynamically. For this reason, the development used Python, Javascript, and the ElasticSearch stack technologies. The dashboard has found its way into Ximea’s day-to-day business processes, helping their collaborators on decision-making support and customer relationship management.

Dissertation Project
“Process Mining in a Hospital Context”
During summer semester 2020, six students of the master IS programme did their project seminar entitled “Process Mining in a Hospital Context” in cooperation with the Business Intelligence (BI) department of the University Hospital Münster. The goal was to develop a process mining software with which the BI department can analyze diverse business processes in the hospital context. Users of the tools can get detailed insights into a given process and detect potential bottlenecks. Examples for such processes are Order-to-Cash (O2C) processes or administrative and clinical processes. The developed application implements the process discovery type and is able to generate a model process in Petri net or BPMN notation from event data input in CSV format. Furthermore, it allows an analysis of Key Performance Indicators (KPIs). Technically, the tool uses state-of-the-art technologies like the Angular and Django web development frameworks inside a Docker container. This makes it easy to extend the application and gives it a promising future for process mining activities inside the BI department.

Ph.D. candidate Nico Grohmann deals with the application of fundamental data mining techniques like association rule and sequential pattern mining to process event data for declarative process discovery. The goal is to establish a routine that is easily applicable in practice and helps to shed light on relationships in processes in a transparent, straightforward way. Simultaneously, users understand how the resulting patterns and rules are transformed to model elements in a declarative modeling language like Declare. This approach may be used whenever classic process mining does not lead to satisfactory results but users still want to gain knowledge about the coherences of a process.

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PROJECT SEMINAR
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Dissertations


Dissertation project
“Fundamental Data Mining Techniques for Declarative Process Mining”
Process mining is a relatively new technology at the intersection of Business Process Management (BPM) and Data Mining. The basic idea is to use traces of process executions supported by information systems for process analysis. Thus, it represents a reverse approach compared to process modeling and the as-is analysis of a process is based on factual event data. Process mining consists of three types. One is based on factual event data. Process Mining-software.com/) where client information is shown in a Web dashboard. The data were collected from heterogeneous online sources such as Wikidata, DBpedia, Twitter, and LinkedIn. The system architecture was developed with a big-data-driven mindset, where high volumes of structured and unstructured data must be collected, integrated, and analyzed dynamically. For this reason, the development used Python, Javascript, and the ElasticSearch stack technologies. The dashboard has found its way into Ximea’s day-to-day business processes, helping their collaborators on decision-making support and customer relationship management.

Publications

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The associated partners are research institutions mainly from Europe, but also from around the world, that have long-standing connections with the network. All associated members are outstanding Information Systems institutions, and, more importantly, the personal relations and close ties between the researchers lead to short communication lines and reliable structures for joint research endeavours.
The Department of Information Systems

The ISOM department contributes to WU’s economics and business programs. It comprises eleven associated professors, who have consolidated the know-how and reputation of the Vienna University of Economics and Business universities, confirming the high standards of our faculty’s efforts in research and teaching.

ISOM
The Department of Information Systems and Operations Management (ISOM) was founded in the course of WU’s organizational restructuring in 2005. Originally, it consolidated the know-how and reputation of six well-established chairs, but has grown since and consists of nine distinctive chairs now – with yet another one joining next year. Further, the ISOM faculty comprises eleven associated professors and more than 70 affiliated researchers and lecturers, conducting research and teaching with their own specific focuses, providing a broad representation of IS topics.

The ISOM department contributes to WU’s bachelor’s program with a major in Information Systems as well as a variety of IS related specializations available for all branches of study. In addition, the department has the lead for two master’s programs.

Our MSc in Supply Chain Management graduates are well prepared to design and manage the future’s most competitive supply chains while also addressing economic, environmental, and social dimensions. The high quality of this well-established and prestigious transdisciplinary master’s program was also confirmed by the SCM ISOM research topic.

The Institute for Information Systems and Knowledge Management conducts research in the fundamentals of blockchain technology and its applications to economics, law, business, and social sciences.

CURRENT RESEARCH PROJECTS

Causal Process Mining: Concepts and Tool (Kate Revoredo, Philipp Wolbel, 2021/22)
This project explores, whether the problem behind so-called Spaghetti models in process mining is fundamentally rooted in the semantic relationships that most process mining algorithms use. Based on this observation, the goal of this project is to define a novel mining approach that considers causal relations between events. Its key idea is to first semantically enrich observed execution sequences before aggregating them. The proposed foundational research project includes development of novel concepts and algorithms, their validation, and creating a tool for practical use and experimental validation.

Erasmus+ „Developing Process Mining Capabilities at the Enterprise Level“ (Uni Liechtenstein, WU Wien, Uni Bayreuth; 2021-2023): Existing research on process mining is little concerned with how process mining is adopted, use, and manage process mining in practice. In particular, smaller companies are largely unaware of how they should proceed when they want to implement this technology. This project pursues three central objectives: 1. Understand companies’ needs with respect process mining adoption, use, and management. 2. Design framework(s) to develop process mining capabilities, which support organizations in adopting, using, and managing process mining. 3. Teach findings to professionals and students in higher education.

SELECTED PUBLICATIONS


57,777 students as of October 2019. The colleges, the ‘entire’ KU Leuven counted and strives for international excellence. Situated in Belgium, in the heart of West-Medicine, Engineering Technology, Arts, and Law. Students from approximately 163 disciplines research institute that focusses on different aspects of public governance. Both fundamental and applied research are part of our activities, with special attention on theory, empirical research and practice. Comparative research in particular is one of our core competencies. Key research topics of LIRIS are:

- Analysis, modeling and architecture of information systems;
- Knowledge discovery, data and process mining;
- Architecture and infrastructure;
- Data, process and decision modeling;
- Business data, process, service, rules and decision management;
- Information strategy.

Public Governance Institute focuses on three distinguishable but partly overlapping clusters within the public governance domain:

- Politics, citizens and policies: this research cluster focuses on the understanding of the relationship between governments, citizens and policy practices.
- Administrative organization and HRM: this cluster focuses on the changes in the governmental landscape and the way in which the government handles its human capital.
- Management of information, performance and finance: this cluster focuses on research about methods and approaches to manage, use and exchange information by governments in the policy, management and financial cycles. This may be within as well as between administrative organisations, but also across and between governments.

CURRENT RESEARCH PROJECTS

Research projects within LIRIS are conducted in four major areas:

Engineering information solutions

Engineering information solutions, dealing with conceptual modelling, data quality and requirements management is a first important area. It allows creating innovative solutions, based on sound modeling principles and aligned with the business.


Business Analytics & Data Science

In close collaboration with a worldwide network of companies and fellow researchers, we study various research topics within the field of data science. Another key research track concerns the development of social network-based analytical models for fraud detection, credit risk modeling and marketing analytics (e.g. churn prediction).

LEUVEN INSTITUTE FOR RESEARCH ON INFORMATION SYSTEMS AND PUBLIC GOVERNANCE INSTITUTE

Recent research projects of Public Governance Institute are:

- Inclusive governance models and ICT for integrated public service co-creation and provision (EC Horizon 2020, 2021–23)
- GODECO, Towards a sustainable open data Ecosystem (MSCA-ITN-ETN, 2021–25)
- Interoperability framework for smart cities and communities (European Commission, 2020–21)
- DigiaFed, Digital (Re)volution in Belgian Federal Government: An Open Governance Ecosystem for Big Data, Artificial Intelligence and Blockchain (BelgGov, 2020–22)

LIRIS RESEARCH CHAIRS WITH INDUSTRY

The Business Information Systems group has a long tradition in industry-funded research chairs. This partnership with industry is a strong valorization of the research efforts and a good source of relevant research questions. Some current research chairs in business processes, decisions and information management:

ING Research Chair: Applying deep learning on metadata as a competitive accelerator.

Brussels Airport Chair: Smart airport operational analytics.

EDUCATION

Erasmus+: Higher Education Joint Master Degrees – Master of Science in Public Sector Innovation and eGovernment together with Westfälische Wilhelms-Universität Münster – University of Münster Frame-work and Tallinn University of Technology.

GEOBIZ – Business driven problem-based learning for academic excellence in geo-informatics (Erasmus+, Western Balkan+ Moldova, 2019–22).


JOURNAL PUBLICATIONS


KU LEUVEN

LEUVEN INSTITUTE FOR RESEARCH ON INFORMATION SYSTEMS AND PUBLIC GOVERNANCE INSTITUTE

KU LEUVEN – Faculty of Economics and Business

http://feb.kuleuven.be
The School of Arts, Sciences and Humanities (EACH) of the University of São Paulo (USP), founded in 1934, is the leading institution of higher education and research in Brazil. USP is a free public university with open access to students selected for an entrance exam. USP forms a large part of Brazilian masters and PhDs and alone accounts for over 20% of all national research production, delivering on average almost 50 research papers per day. There are seven university campuses in the state of São Paulo; the main campus is in the city of São Paulo, the state capital. The university has nearly 50 schools and institutes covering all areas of knowledge. There are about 350 undergraduate programs and 250 graduate programs serving almost 100,000 students.

The School of Arts, Sciences and Humanities (EACH), created in 2003, is an interdisciplinary unit of USP that brings together 11 schools and 11 graduate programs in different areas of knowledge. Of these, we act in the Bachelor’s in Information Systems undergraduate program, with nearly 40 faculty members, and in the Master of Science and PhD in Information Systems graduate program, with nearly 20 faculty members. Our graduate program in information systems has two broad research lines — “systems management and development” and “systems intelligence” — both with strong appeal in applied computing.

Two other USP units with a strong presence in the information systems and applied computing area are: the Institute of Mathematical and Computer Sciences (ICMC), in the campus of São Carlos, with nearly 50 faculty members, and the School of Philosophy, Science and Literature (FFCLRP), with the Department of Computing and Mathematics, in the campus of Ribeirão Preto, with nearly 15 faculty members.

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**CURRENT RESEARCH PROJECTS**

**Process Mining**

The quality of business processes running in organizations is of utmost importance in achieving the organization’s strategic goals. This project aims to explore key machine learning and computational intelligence techniques to discover advanced process knowledge for process and organizational improvement.

**Smart Toys and Social Robots**

Smart toys are becoming more attractive in the computing field, USP contributes research in a variety of areas, including some focused specifically on information systems. Some important research topics are: artificial intelligence; big data; bioinformatics; bio-inspired computing; biometrics; business process management; chemistry; complex networks; computational neuroscience; concurrent programming; databases; distance learning; distributed systems; economics; education; e-government; embedded systems; enterprise environments; functional genomics; games; graphics processing; health; human-computer interface; internet of things; IT management; linguistics; machine learning; medical images; mobile devices; mobile robotics; multimedia interactive systems; natural language processing; pattern recognition; process mining; robotics; serious games; smart toys; social networks; software engineering; systemic biology; web systems.

**RESEARCH TOPICS**

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elderly in their homes and to propose activities to reduce these states, providing a better quality of life.

**EVENTS**


**PUBLICATIONS**


**University of São Paulo (copyright – Jornal da USP)**
The Faculty of Mathematics and Physics has been created by separating a part of the Faculty of Natural Sciences on 1 September 1952. Today it consists of three schools: School of Physics, School of Mathematics, and School of Computer Science.

The School of Computer Science at the Faculty of Mathematics and Physics includes eight prestigious teaching and scientific workplaces. The quality of their graduates is widely recognized. Among them are a number of top experts working as computer program developers and technological innovators. They are also successful as entrepreneurs. Members of the School of Computer Science achieve outstanding scientific results in discrete mathematics, especially in graph theory and its application in intelligent systems, optimization, programming methods, semantics and building large software systems, processing natural language, and many others.

The Department of Software Engineering focuses on research and teaching in the areas of database systems, semantic web, similarity search, bioinformatics & chem-informatics, general indexing, multimedia, XML technologies, parallel computing, Big Data, and e-Science.

RESEARCH TOPICS

The department consists of three research groups.

**Similarity KEtrieval Research Group (SiRet)**

SiRet was founded in 2006 at the Department of Software Engineering, Faculty of Mathematics and Physics, Charles University in Prague. SiRet deals with database methods for efficient and effective similarity search in databases of complex unstructured objects. In particular, SiRet is interested in three areas: general methods of indexing similarity (metric and non-metric spaces), biological applications of the similarity search, indexing image databases for content-based retrieval. The research in bioinformatics focuses on the development of software tools applicable mainly in the domain of structural bioinformatics and visualization. This includes tools for protein binding site detection, with the application in computational drug discovery, or tools for visualization of macromolecular structures. All the methods are implemented as software solutions used by thousands of users all over the world.

**XML and Web Technologies Research Group (XRG)**

The XML and Web Technologies Research Group focuses on XML and Web technologies and their exploitation, service-oriented architectures (design, implementation, management), evolution, change management and adaptability of applications, efficient processing of graph data (XML, RDF, linked data), ontologies, Web 2.0, and semantic web services. The research group is currently mostly concerned with Big data, linked data, and graph databases research. XRG is also focused on multi-model databases.

**Parallel Architectures/Algorithms/ Applications Research Group (PARG)**

http://www.ksi.mff.cuni.cz/parg/

The PARG focuses on multi-core CPUs and NUMA servers programming, many-core GPUs and GPGPU computing, utilization of emerging parallel architectures (Intel MIC, Parallel/Epiphany), distributed computing on tightly coupled clusters, parallel data processing, concurrency in database systems, and languages (and compilers) for parallel processing. In general, PARG is focused on algorithms, architectures, applications in the area of high-performance computing.

CURRENT RESEARCH PROJECTS

The department members are involved in a number of research projects funded by the Czech Science Foundation and the Technology Agency of the Czech Republic. In the SiRet group the projects concern three scientific areas: Bioinformatics & Cheminformatics, e.g., rPredictorDB is a predictive database of secondary structures of individual RNAs and their formatted plots. The structures are generated by template-based prediction of RNA secondary structure approaches with experimentally identified structures as templates. The XRG is also focused on multi-model databases.


definition of advanced methods of knowledge discovery in astrophysics, including soft-computing techniques like evolutionary algorithms and knowledge discovery algorithms and techniques.

**PUBLICATIONS**


J. Pokorný, K. Richta: Towards Conceptual and Logical Modelling of NoSQL Databases. ISD 2021. 420 951 554 265


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1632, is one of the oldest universities in the world. The University of Tartu, situated in the capital city of Tartu, Estonia, is known for its strong focus on research and innovation. It was founded in 1632 and has since grown to become a leading institution in Europe and beyond.

The University of Tartu is proud of its rich history and its commitment to excellence in education and research. It is home to a diverse community of students and faculty from around the world, who contribute to the vibrant academic environment of the university.

The University of Tartu is composed of several faculties, including the Faculty of Social Sciences, the Faculty of Medicine, the Faculty of Natural Sciences, and the Faculty of Information Technology. Each faculty is dedicated to providing high-quality education and research opportunities for students.

The University of Tartu is also recognized for its contributions to the field of e-governance and digital public services. The Johan Skytte Institute of Political Studies (CITIS) is a research unit within the university, focusing on comparative politics, international relations, and political theory.

The institute is one of the few research groups in Estonia focusing on quantitative methods in the study of politics. It is also one of the institutions driving public innovation in Estonia, with a focus on e-governance and digital public services.

The university is ranked 285th in the QS World University Rankings of 2021. It is placed 2nd in the QS University Rankings: Emerging Europe and Central Asia (QS EECA University Rankings 2021). The university has four faculties—Arts and Humanities, Social Sciences, Medicine, Science and Technology—and is home to 13,000 students (including around 1,700 international students from 90 countries).


Leask, Nele; Polder, Irma; Schmidt, Carsten; Kalvet, Tarmo; Krimmer, Robert; (2022). Drivers for and Barriers to the Cross-border Implementation of the Once-Only Principle. In: Krimmer, Robert; Prentza, Andriana; Mamrot, Szymon; Schmidt, Carsten; (Ed.). The Once-Only Principle (28–60). Cham: Springer International Publishing. (Lecture Notes in Computer Science; 12621). DOI: 10.1007/978-3-030-79851-2_3.


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UNIVERSITY OF TURKU
TURKU SCHOOL OF ECONOMICS –
INSTITUTE OF INFORMATION SYSTEMS SCIENCE

ABOUT THE INSTITUTION
The roots of the Institute for Information Systems Science were established in 1971. Nowadays, the Institute is a part of the Department of Management and Entrepreneurship at the University of Turku. The mission of the Institute is to educate professionals who master both general management as well as information systems skills. In research, the Institute focuses on supporting companies and public organizations as well as the third sector in their information systems management. Issues at an individual, industry, national, and international level are not neglected. Furthermore, the Institute has been a pioneer in English-speaking education even at the level of the whole university, running three international master degree programs.

CURRENT RESEARCH PROJECTS
The institution runs a rich portfolio of projects in different areas. The AIGA project (2020–2022) explores how to execute responsible artificial intelligence (AI) assimilation in public sector organizations: The case of Saudi Arabia. Government Information Quarterly, 32, 101617.


PUBLICATIONS


Dissertations
University of Turku Information Systems Science Doctoral Theses 2021:


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KEDGE BUSINESS SCHOOL
DEPARTMENT OF OPERATIONS MANAGEMENT AND INFORMATION SYSTEMS (MOSI)

ABOUT THE INSTITUTION
Founded in 1874, KEDGE is a leading French business school with four campuses in France (Paris, Bordeaux, Marseilles and Toulon), three abroad (Shanghai, Suzhou and Toulon) and three partner campuses (Avignon, Bastia and Bayonne). The KEDGE community is made up of 12,500 students (including 50% coming from abroad), 174 professors (including 51% coming from abroad), 275 international academic partners and more than 60,000 alumni around the world.

Kedge Business School offers a variety of degree programmes, from undergraduate to PhD, performed by its core faculty and more than 60,000 alumni around the world.

KEDGE BUSINESS SCHOOL – Department of Operations Management and Information Systems (MOSI) www.kedgebs.com

CURRENT RESEARCH PROJECTS
1. Analysis of quantum computing development using dynamic communities’ detection and topic modelling
2. DESIDE – logistic chains in an uncertain world
4. VITRE – logistics and optimisation in supply chain management
5. Covid-19 outbreak era – how to mitigate the disruption impacts on supply chains’ resilience and robustness

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PUBLICATIONS

PIRAYESH, A., A. GULLOLUX – “Cubyn : solutions logistiques pour le e-commerce en croissance” – 2021, CCMIP.


SERIOUS GAMES”, IEEE Access, April 2021.

https://kedge.edu/annuaire/tatiana-bouzdine-chameeva

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UNIVERSITY OF LIECHTENSTEIN
INSTITUTE OF INFORMATION SYSTEMS –
HILTI CHAIR OF BUSINESS PROCESS MANAGEMENT

ABSTRACT
The institute is also a co-founder of the Hilti Chair of Business Process Management, held by Prof. Dr. Jan vom Brocke. The institute hosts two further chairs, the Hilti Chair for Data and Application Security and the Hilti Chair of Business Process Management. The institute represents the Association for Information Systems (AIS) in Liechtenstein through the Liechtenstein Chapter of the AIS (LCIAS), which was recognised as Outstanding Chapter of the AIS for the seventh consecutive year in 2020. The LCIAS, received the AIS Outstanding Chapter Award 2020 for achievements in research, teaching, and knowledge transfer. The LCIAS is among the 41 AIS Communities to earn the designation of Outstanding SIG, Section or Chapter for 2020.

RESEARCH TOPICS
Our research addresses information systems from four complementary perspectives (in alphabetical order):

- Data – Data science focuses on capabilities to harvest and analyse data as a key enabler for improving and innovating processes as well as services, products, and business models.
- Innovation – Digital innovation focuses on the transformative power of digital technologies to create new IT-enabled products, processes, and business models.
- Processes – Business process management takes an innovation-driven and value-oriented perspective on business processes to identify and evaluate the business potential of information and communication technologies in contemporary organisations.
- Security – Data and application security focuses on the development of reactive and proactive security mechanisms.

CURRENT RESEARCH PROJECTS
Erasmus+ Project: Developing Process Mining Capabilities at the Enterprise Level together with the University of Bayreuth, and the Vienna University of Economics and Business, the University of Liechtenstein is working on this project. The project takes an innovation-driven and value-oriented perspective on business processes to identify and evaluate the business potential of information and communication technologies in contemporary organisations.

TOGETHER WITH THE UNIVERSITY OF BAYREUTH, AND THE VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS, THE UNIVERSITY OF LIECHTENSTEIN IS WORKING ON THIS PROJECT. THE PROJECT TAKES AN INNOVATION-DRIVEN AND VALUE-ORIENTED PERSPECTIVE ON BUSINESS PROCESSES TO IDENTIFY AND EVALUATE THE BUSINESS POTENTIAL OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN CONTEMPORARY ORGANISATIONS.

AWARDS
World Scientist and University Ranking 2021: Prof. Dr. Jan vom Brocke has been listed in World Scientist and University Ranking 2021 among the top 1% most cited researchers in Europe across all fields of science (# 7288 out of 216 537), ranked # 25 183 worldwide (out of 699 268), and # 1 for Liechtenstein.

AIS Outstanding Chapter Award 2020: In 2021, the Liechtenstein Chapter of the AIS (LCIAS), received the AIS Outstanding Chapter Award 2020 for achievements in research, teaching, and knowledge transfer. The LCIAS is among the 41 AIS Communities to earn the designation of Outstanding SIG, Section or Chapter for 2020.

BPM 2021 Case Innovation Award: Prof. Dr. Jan vom Brocke, Dr. Thomas Grisold and Manuel Weber have been awarded the BPM 2021 Case Innovation Award for the research paper "A Matrix for Context-Aware Business Process Management: Empirical Evidence from Hilti", presented at the 19th International Business Process Management Conference 2021 (Industry Forum) in Rome, Italy.

AIS Best Information Systems Publications Award: Prof. Dr. Stefan Seidel received together with his co-authors Nicholas Be-rente (University of Notre Dame, USA) and Hani Safadi (University of Georgia, USA) the "AIS Best Information Systems Publications Award" for the article "Data-driven computationally intensive theory development" published in the Information Systems Research journal.

Digital Leader 2020: For the year 2020, Prof. Dr. Jan vom Brocke and Prof. Dr. Pavel Laskov have been appointed "Digital Leader 2020" by the initiative Digital Liechtenstein, for taking an active role in the development of Liechtenstein and its region towards digital innovation and transformation.

PUBLICATIONS


CONTACT DETAILS
UNIVERSITY OF LIECHTENSTEIN – Institute of Information Systems – Hilti Chair of Business Process Management
www.uni.li/iwi

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Dissertations
The Department of Information Systems at Kaunas University of Technology (headed since by prof. R. Butleris). In 2014, quality education on fundamental and advanced subjects in the field of information systems. The Department has developed first and second cycle study programmes titled “Information Systems” and “Information Systems Engineering” respectively. For the 2021–2022 study year, 33 new students were admitted to the Bachelor study programme, and 10 – to the Master’s. There were also 8 PhD students at the Department.

RESEARCH TOPICS
The KTU Department of Information Systems / Centre of Information Systems Design Technologies specializes in areas related to Information Systems and Software Engineering, namely:

- Model-driven development, model-to-model transformations
- Computer aided software engineering (CASE) technologies
- Conceptual modeling and databases
- Modeling of business processes, business vocabularies, and business rules
- User needs analysis and requirements modeling
- Ontologies and solutions for the Semantic Web
- Big data and business intelligence
- Knowledge based systems
- Model-driven testing of information systems
- Project management
- Information systems user interface and usability
- Machine learning
- Blockchain technologies

SELECTED RESEARCH AND DEVELOPMENT PROJECTS
- Development of the Artificial Intelligence and Statistical Models Ensemble Construction Algorithm (2019–2021), Commissioned by JSC “RIVILĖ”.
- Model-based evaluation of the system of systems architectures used for improved physical and mental well-being (SOAR) (2020–2022). Funded by the European Regional Development Fund. Coordinated by the Chalmers University of Technology and carried out in partnership with Halmsgard University and University of Oslo.

EVENTS
The 27th International Conference on Information and Software Technologies took place on October 14–16, 2021, in Kaunas, Lithuania. ICIST is organized annually by the Faculty of Informatics of Kaunas University of Technology and is chaired by the professor Audrius Lopata of the Department of Information Systems.

PUBLICATIONS


DISSEMINATIONS


CONTACT DETAILS

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The research in the Department of IS is one of four departments within the Faculty of Social Sciences at the University of Agder (UiA). With an academic staff of 28 permanent positions and 4 adjunct professors, this is one of the largest IS departments in Norway.

The department offers a three-year bachelor’s programme in IT and Information Systems, a one-year undergraduate study in IT and Information Systems, and a two-year master’s programme in Information Systems which started in 1999 as the first IS master programme in Norway. In addition, a two-year joint master’s programme in Cybersecurity was established in 2019. The department does also offer a three-year PhD programme in Information Systems which currently has 14 research fellows enrolled.

The Department of Information Systems contributes actively to the IS community by publishing in leading IS journals, hosting and participating in international conferences.

**RESEARCH TOPICS**

The research in the Department of IS is mainly organized in three interdisciplinary centres:

- **Centre for Digital Transformation (CeDiT)** conducts advanced social science research on the relationships between digital technologies and societies, organizations, and individuals. CeDiT applies disciplinary, multidisciplinary, and interdisciplinary approaches and draws on a wide range of theories from social science.

- **Centre for eHealth** carries out user-centred research focusing on co-creation in telemedicine and welfare technology. The aim of the centre is to make everyday life easier in today’s health society by developing technological solutions such as smart home solutions and digital homecare services.

- **Centre for Integrated Emergency Management (CIEM)** focuses on technology-based innovation for societal resilience. CIEM conducts research in collaboration with emergency stakeholders and focuses on community resilience and crisis communication, information sharing for situational awareness, technological advancements to support humanitarian aid, cybersecurity, and new technologies for emergency management operations (e.g., drones, robotics, and augmented reality).

**CURRENT RESEARCH PROJECTS**

The Department of IS at UiA is involved in several research projects. The following describes a few examples of current projects led by researchers at the department.

- **ALaUsers** (2020–2024) is a project funded by the Research Council of Norway addressing the “black box” problem contributing to the responsible use of AI when digitalizing public services. The novelty of ALaUsers is that it targets specifically non-data scientists extending the reach of research beyond data scientists.

- **Digitalizing public welfare services** (2021–2024) is a project funded by the Research Council of Norway. The objective is to identify public services suitable for digital communication.

- **Virtual Open Innovation Lab** (VOIL) (2020–2024) is a project funded by the Research Council of Norway. VOIL aims at developing resources to support the learning of emerging technologies and assess their potential for digitally transforming SMEs and micro-enterprises.

- **Sharing incident and threat information for common situational understanding (INSITU)** (2019–2022) is a project funded by the Research Council of Norway. INSITU will develop knowledge and solutions for effective information sharing among emergency responders in complex operations requiring collaboration between several agencies.

- **Covid-19** Network Technology based Responsive Action (CONTRA) (2020–2021) is a project funded by the Research Council of Norway. CONTRA aims to develop a decision support system for pandemic responders to design a supply chain for Covid-19 vaccines that is effective, efficient, sustainable, and fair.

- **Digital Infrastructure for Robust and Scalable PatientMonitoring in Pandemic Response Situations (DIPAR)** (2020–2022) is a project funded by the Research Council of Norway. The aim is to provide digital homecare for patients with Covid-19 infection. The project expanded an existing solution for digital follow-up of residents with chronic illnesses.

**EVENTS**

- **InfraHealth 2021**: Digitalization and Personal Health Data hosted by UiA in September 2021. The conference is the 8th International Conference on Infrastructures in Healthcare. The focus is on personal health data and their use through new types of applications, and the use of AI and new types of work processes.

**PUBLICATIONS**


- **Pappas, I. O., & Giannakos, M. N. (2022).** Rethinking Learning Design in IT Education During a Pandemic. Frontiers in Education, 6, 652856.


**DISSESSATIONS**


1,767 academic staff members, the Department of Business Informatics (BI) of the University of Gdansk is involved about the institution in more than 270 specialisations. The Department of Business Informatics (BI) of the University of Gdansk is involved in research and teaching in the field of Business Informatics on the Bachelor, Master, Post-Diploma, and Doctoral levels. For 20 years, the Department of Business Informatics has been running the Pomeranian Regional Academy Cisco, educating hundreds of computer network administrators with professional skills confirmed by international Cisco certificates.

As far as teaching is concerned, some of the Departments' academic manuals are bestsellers in Poland, like 896 pages book “Business Informatics. Theory and Applications.”, PWN, 2019 (in Polish). This book was awarded in the Competition of Polish Society for Informatics, for the best informative book of 2019. The Department is also active internationally, organising conferences including the 10th European Conference on Information Systems (ECIS 2002) titled “Information Systems and the Future of the Digital Economy”. The 7th International Conference on Perspectives in Business Informatics Research (BIR 2008), The 8th International Conference on European Distance and E-Learning Network (EDEN 2009), and the series of events branded now as EuroSymposium on Digital Transformation. The Department is the associate partner of the European Research Center for Information Systems (ERCIS) consortium, from 2004.

In the years 2013-2017, the Department of Business Informatics of University of Gdansk participated in the World IT Project (S. Wrycza and D. Goja), regarding ITOC – Occupational Culture of IT in various civilisation areas, coordinated by University of North Carolina, USA. In 2019 the summarising publication 552 pages book entitled “The World IT Project. Global Issues in Information Technology”, World Scientific-Now Publishers, 2020, was published. In the succeeding chapters, the outcomes of research from 37 countries are presented.

The Annual International Conference on Perspectives in Business Informatics Research – BIR.

The Department is involved in the following international and research initiatives:

- **Polish Chapter of Association for Information Systems – PLAINS** was awarded five times by AIS as the outstanding chapter – in 2014, 2016, 2017, 2018, and 2019. Polish Chapter of AIS – PLAINS was established in 2006 as the joint initiative of prof. Claudia Loebbecke, University of Cologne, Germany, former President of AIS, and prof. Stanisław Wrycza, University of Gdansk, Poland. PLAINS co-organises international and domestic conferences on Business Informatics and now on Digital Transformations. There is a very dynamic and creative Gdańsk AIS Student Chapter at the Department of Business Informatics, one of only few European AIS Student Chapters. Student teams of this branch are awarded annually in the global AIS Competition for students for their projects and works in 2015–2020, successively at: University of Alabama (2015), Indiana University (2016), Bingham Young University (2017), University of Texas in Dallas (2018), and Illinois State University (2019 – 1st place).

- **NTIE** (Naukowe Towarzystwo Informatyki Ekonomicznej) – Polish Society for Business Informatics Research.

**RESEARCH TOPICS**

The areas of research interest at Department of Business Informatics cover the following theme:

- Agility
- Big Data
- Business Informatics
- Business Processes Modelling
- Digital Transformation
- ERP, CRM, SCM, WFM, BI Systems
- Information Systems Development
- ICT Global Development
- IT Acceptance Research
- SCRUM
- Social Media Analytics
- UML, and SysML

**CURRENT RESEARCH PROJECTS**

Development and Launch of Master Studies on Business Informatics (in English) at the Faculty of Management of University of Gdańsk in the academic years 2021–2022 in intensive cooperation with SUA – SAP University Alliance including alliances, its rich educational e-learning resources.

**AIS Student Chapter** gained the title of Best New Chapter Award for the years 2015–2016 and in 2017 the title of Outstanding Fundraising Award for AIS Student Chapter. Each yearly Student Competition is connected with the advanced Annual AIS Student Chapter Leadership Conference.

**PUBLICATIONS**

**Edited books**


**Journals articles**


**Monograph articles**


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**Conference materials**


WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF APPLIED INFORMATICS

ABOUT THE INSTITUTION
The Department of Applied Informatics (DNi) is headed by Professor Nguyen Thanh Nguyen, who is a part of the Faculty of Information and Communication Technology at the Wrocław University of Science and Technology. The Faculty of Information and Communication Technology (FICT) is the largest institution of this type in Poland, which was officially opened on 15 September 2021. The Faculty consists of 12 fields of study and as many as 5,000 students. Our department currently consists of 52 students. We regularly co-organize three conferences on Intelligent Information and Technology. FICT consists of 12 fields of study and as many as 5,000 students.

Our main objective is to carry out basic and applied research in the field of Applied Informatics (AI). Due to ERCIS classification, the following clusters have been identified: (1) Data Science and Artificial Intelligence, (2) Process Science, (3) Knowledge and Learning, (4) Supply Chain Management and finally (5) Digital Public Services. The major issues, perspectives and challenges are as follows:

- **Computational Collective Intelligence**, mainly established in cluster (4), is understood as an AI sub-field dealing with soft computing methods that enables making group decisions or processing knowledge among autonomous units acting in distributed environments. Web-based systems, social networks and multi-agent systems will very often need such tools for working out consistent knowledge states, resolving conflicts and making decisions.

- **Knowledge Management Systems**, referred to any kind of IaaS from cluster (5) that store and retrieve knowledge, improve collaboration, locate knowledge sources, mine repositories for hidden knowledge, capture and use ubiquitous knowledge.

- **Agents and Multi-Agent Systems** related to cluster (2) for constructing autonomous, complex and intelligent systems including the specification of agent communication languages and formalisation of ontologies. Agent communication languages provide standard declarative mechanisms for agents to communicate knowledge, whereas ontologies are meant for conceptualisation of the knowledge domain.

- **Recommendation and Personalization** methods applied in all ERCIS clusters and several domains, such as net-news filtering, web recommender, personalised newspaper, sharing news, movie recommender, e-commerce, travel recommender, e-mail filtering, music recommender, user interface recommendation, negotiation systems, etc.

- **Ensemble and Hybrid Models** resulted in all ERCIS clusters that combined linear and non-linear features of existing models of Computational Intelligence. To the methods of ensemble learning, we classify bagging, boosting, stacking, subsampling, random subspaces, mixture of experts, and others.

- **Semantic Information Retrieval** ranged from link structure analysis to using social network relationship semantics and come up in cluster (3). We use and research paradigms and technologies like Semantic Web, linked data, Web ontologies, and Web data aggregation.

- **Multimedia Information Processing** covering clusters (1), (3), (5) with the following aspects: audio signal processing, image recognition and video clustering, loss and lossless compression.

- **System Performance Analysis** merges clusters (2), (4), and (5) with content caching techniques, usability testing, content indexing algorithms, and Web-based optimisation techniques.

- **E-Learning Methodologies** focused on applications from cluster (1) of online collaboration paradigms, like wiki and video conferencing, Learning Management Systems and Learning Content Management Systems, digital documentation techniques.

**CURRENT RESEARCH PROJECTS**

The Department of Applied Informatics, as in the previous year, was involved in two international and two national projects.

1. Joint Polish-Vietnamese research agreement led by the Ho Chi Minh City International University and the Department of Applied Informatics at the Wrocław University of Science and Technology. Duration: 2020–2022.

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2. Polish-Norwegian research project on "Highly accurate and autonomous programmable platform for providing data services on air pollution to drivers and public entities" (HAPADS) funded by the National Center of Research for Research and Development. Duration: 2020–2022.

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   Contact: Dr. Marcin Pietranik

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**AWARDS**

Prof. Dariusz Król was instituted for the Vice-Dean for General Affairs position in the Faculty of Information and Communication Technology at the Wrocław University of Science and Technology for a term of three years.

The results of the PRIMUS programme for top-tier publications and the SECUNDUS programme for the best track record among young scientists have been announced at the WUST. Many employees of our Department have been recognised: Dr. Rafal Kern, Dr. Michal Kędziora, Dr. Adelina Kozierekiewicz, Prof. Nguyen Thanh Nguyen, Dr. Marcin Pietranik.

Prof. Dariusz Król was elected to the position of Vice-Chairman of the Polish Chapter of the IEEE SMC Society SMC-28 for a term of two years.

The course "Introduction to Artificial Intelligence" by Krzysztof Brotzowski, Dariusz Król, Ngoc Thanh Nguyen, Maciej Plasecki, Olgierd Arab was qualified for funding under NAWA'S STER Programme: Internationalisation of Doctoral Schools.

**PUBLICATIONS**


**CONTACT DETAILS**

**PROF. NGOC THANH NGUYEN**
Ph.D., D.Sc., ACM Distinguished Scientist, Head of Department of Applied Informatics, Chair of the Wrocław University of Science and Technology (WUST) – Department of Applied Informatics


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The Department of Information Systems promotes academic work that focuses on themes at the intersection of information technologies, information, and human and social endeavors. Particular importance is given to design activities addressing phenomena that embrace that intersection to solve enterprise problems or seize opportunities where information technology plays a central role. Research activities combine engineering and technology research methods with those used in organizational/social contexts and on developing grounded design knowledge (e.g., methods, techniques, tools) for the activities of Information Systems and Technologies (IST) professionals (mainly, designers of human activity systems and managers of IT-related resources). The final goal is to ensure that IT resources contribute to the well-being of the embracing human activity systems.

**Research Topics**

The research performed by the Department's faculty is consolidated in the IST (Information Systems and Technologies) research group of ALGORITMI. This stream includes three leading research labs:

- **Intelligent Data Systems** that deals with technologies, tools, models, and techniques related to Data Mining and Data Warehousing Systems. The main objective is the research in knowledge areas such as Adaptive Business Intelligence, Intelligent Decision Support Systems, Data Mining, Intelligent Data Analysis, Data Warehouse, and OLAP.

- **Information Systems and Technology for the Transformation of Organizations and Society**: The researchers in this lab adopt interdisciplinary approaches and research methods originated in the social sciences and engineering. The main focus is on understanding the adoption, use, and exploration of Information Technology (IT) in organizational/social contexts and on developing grounded design knowledge (e.g., methods, techniques, tools) for the activities of Information Systems and Technologies (IST) professionals (mainly, designers of human activity systems and managers of IT-related resources). The final goal is to ensure that IT resources contribute to the well-being of the embracing human activity systems.

- **Software Engineering and Management** group is devoted to the development of state-of-the-art software-based information systems. This group focuses on both the engineering and management dimensions of the following research topics: (i) analysis and design of information systems; (ii) business and location-enhanced database systems; (iii) metadata and ontologies for the semantic Web; and (iv) process and project management life-cycles.

**Current Research Projects**

In 2021, the IST research was funded by new projects, including:

- **VOIL** – Virtual Open Lab (www.voil.eu);
- **AugmentedWebEdu** – Integrating virtual and AUGMENTED reality with WEARable technology into engineering EDUCation (https://augmentedwearedu.uis.no);
- **IVISSM** – 6,849,32 Journals Articles Everyday: Visualize or Perish! (http://www.ivissm.net);
- **IntVIS4Insp** – Intelligent and Flexible Computer Vision System for Automatic Inspection (http://www.ccg.pt/my-product/intvis4Insp);
- **Empreende Makers: De EMakers a EMpreendedores** (https://algoritmi.uminho.pt/projects/empreende-makers.de-ermakers-a-empreendedores);
- **ICDS4IM** – Intelligent Clinical Decision Support for Intensive Medicine (https://algoritmi.uminho.pt/projects/icds4im.intelligent-clinical-decision-support-for-intensive-medicine);
- **FISHY – A coordinated framework for cyber resilient supply chain systems over complex ICT infrastructures** (https://fishy-project.eu);
- **TSIM – Test System Intelligent Machines** (http://www.ccg.pt/my-product/tsim-test-system-intelligent-machines);

**Publications**


**Dissertations/ habilitations**

HSE is composed of more than 15 faculties and more than 20 departments, will begin to work on the following research projects.

- Development of a methodology for numerical modeling of a double electric layer at the electrode-electrolyte interface
- Development of methods for studying the historical structure of a population by modern genetic studies
- Quantum hardware components and photonics is a rapidly developing research area of MIEM. The research activity is focused on the scientific and technological issues related to the creation of quantum hardware components for electronics manufacturing.

Advanced research in the field of computer security is aimed at solving the problem of cloud storage protection, safe computing, post-quantum cryptography.

Computer simulation of radio-electronic equipment is a well-established area of our research. Now the field has widened, thanks to its merging with digital synthesis of microelectronics.

Certain fields, that are closely linked with major topics, are developed. These include aerospace technologies, technologies for remote Earth sounding and geospatial data processing, supercomputer simulations of physical processes, new materials, and engineering systems.

**RESEARCH PROJECTS**

- Development of a methodology for numerical modeling of a double electric layer at the electrode-electrolyte interface
- Development of methods for studying the historical structure of a population by modern genetic studies
- Quantum hardware components and photonics is a rapidly developing research area of MIEM. The research activity is focused on the scientific and technological issues related to the creation of quantum hardware components for electronics manufacturing.
- Mathematical modeling of transport processes in complex physical systems, including quantum ones
- Study of population structure by modern and ancient genomes, study of evolution–any mechanisms from the point of view of population genetics
- Development of routing algorithms in on-chip networks
The Higher School of Economics in Nizhny Novgorod (HSE NN) was founded in 1996. The main educational activities of the Faculty of Informatics, Mathematics and Computer Science (IMCS) of the HSE NN are related to modern enterprise organization, enterprise architecture, business methodologies for Networks Analysis), and TMD (Topological Methods in Dynamics) are the research units of the Faculty IMCS. In 2014, the Department of Fundamental Mathematics was opened.

**RESEARCH TOPICS**

- Cognitive science – the development of methods and techniques of receiving, processing, storage, use and management of professional knowledge.
- Situational Modeling – multidimensional modeling of the behavior and decision making processes of individual and collective agents in complex distributed systems.
- Original ways of formalizing the knowledge, which are based on ontological engineering, and are supplemented by practical methods of integration and verification of complex corporate service oriented systems.
- New mathematical models and multiagent optimization algorithms in distributed service-oriented systems applicable to different domains (transport, planning, training activities); the result defines new approaches to the creation and use of intelligent decision support systems in the modern service-oriented economy.
- Axiomatic approach to non-compensatory aggregation (decision making rules) and axiomatic approach to general measure of power (power indices) in a voting body.

**CURRENT RESEARCH PROJECTS**

- Development and analysis of new methods of sub-symbol distributed computing for the aggregation of linguistic estimates in multi-criteria choice problems.
- Study of rogue waves in the World Ocean based on observational data and modeling of real events.

**AWARDS**

- Professor Dmitry Malyshev (LATNA laboratory) was awarded a Moscow Government Prize for Young Scientists in the category “Mathematics, Mechanics and Computer Science” on the topic of research: Algorithmic issues of topological hereditary subproblems of discrete extremal problems on graphs.

**SELECTED PUBLICATIONS**


Churav-E. Saschenko A. Touching the Limits of a Dataset in Video-Based Facial Expression Recognition, in International Russian Automation Conference (RussAutoCon), IEEE, 2021. P. 633–638.


The Faculty of Organizational Sciences is a founding member of the University of Maribor and has more than 60 years of tradition in the field of organizational and information systems science. The faculty provides three main study programs related to the management of information systems, human resource and educational systems, and business and work systems. During this period, the faculty provided more than 20,000 graduates. The research area of the faculty covers complex dynamic management systems, covering aspects from human resources, information systems, business processes, and general management. Research is organized in many laboratories and in the center. All are involved in research projects, prototyping, consulting, education, and training at national and international levels. Their activities have been organized and are run following the LivingLab approach, with strong connections with numerous institutes, faculties, and universities around the world and strives to enhance its internationally renowned reputation.

**Research Topics**

The research area of the faculty of Organizational Sciences is focused on the investigation of complex dynamic management systems, covering various aspects from human resources, information systems, business processes, and general management. The significant focus is on digital transformation of organizations and society. In particular, we investigate the implementation of the newest ICT and their transformation of organizations and society. In particular, we investigate the implementation of the newest ICT and their impact on the evolution and design of (digital) business models achieving sustainable performance from an economic, social, and environmental perspective.

**Current Research Projects**

- **EU projects and Bilateral projects**: Business Informatics Programme Re-engineering
- Development of a cyberphysical system for stress control for individuals and groups at-risk – Bilateral Project
- **Building Next Generation Competencies for Logistics and Supply Chain Managers**
- Impact of COVID-19 pandemic on digital transformation of SMEs
- Hospitals and faculties together for prosperous and scientific based healthcare (ProCare), Erasmus+
- Remote working management skills for HR professionals

**National Research Programme**

- Decision support systems in digital business, Research programme, Ps 0018
- Impact of management, organizational learning and knowledge management in modern organizations, Research programme, Ps 0364-0586

**EU projects and Bilateral projects**


**Selected Publications**


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The mission of the Department of Industrial and Management Engineering is an academic discipline that involves the study of the design, development, and the management of integrated systems of people, materials, equipment, and information in a variety of sectors. Therefore, Industrial and Management Engineering provides excellent opportunities to create new values about the institution and innovations in today’s dynamic global environment.

We are pursuing an understanding of engineering technology and management by combining the contents of business administration with the existing industrial engineering field. While Industrial Engineering deals with the systematic planning, design, and optimization of complex industrial systems, Industrial and Management Engineering extends its coverage to more comprehensive fields, including the service industry, information industry, and management science.

The mission of the Department of Industrial and Management Engineering is to cultivate creative leaders in the era of environment.

The Future City Open Innovation Center (FOIC) focuses on the development of innovative future and smart city technologies, including retrofitting existing infrastructures with the latest technological advances for the efficient establishment and proliferation of a smart city.

The Open Innovation Big Data Center (OIBC) focuses on developing platform technologies from big data gathered from the implementation of FOIC-led initiatives. Both centers are based on a foundation of open cooperation: the Open Innovation Centers aim to create socioeconomic value by attracting companies and startups to foster their growth through collaboration with the University’s advanced research infrastructures.

CURRENT RESEARCH PROJECTS
• Blockchain platform with business models towards cross-domain interoperability (Ministry of Science and ICT, Jun. 2018 – Dec. 2021). The objective of the project is developing a blockchain platform that supports cross-domain interoperability. The platform will be applied in three industries such as healthcare, insurance, and automotive.

AWARDS
Dr. Minseok Song won Mooseunje Chair Professorship at POSTECH, 2021.
Mr. Minchul Jung won SPIK Young Investigator Award at the Science & Football International Conference, 2021.
Shinyaum Park, won Minister of MITIE (Ministry of Trade, Industry and Energy) award (the 1st prize) at the First Korea Industrial Research Project Challenge, Dec. 2020.

SELECTED PUBLICATIONS

DISSETATIONS/HABILITATIONS

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CONTACT DETAILS

Jinki Kim, Two Essays on Optimal Asset Allocation with Correlation Risk.
The Universidad de Sevilla (US) was established in 1505 and, with more than 70,000 students and 6,800 staff, is the third-largest university in Spain. US embraces academia, industry, engineering and science and, with a relevant educational and technological infrastructure, is an intellectual reference in the South of Europe. More than 10,000 students are following postgraduate courses, enrolled into 86 master programs and 52 doctoral programs. US holds academic partnerships with 850 institutions throughout the world.

US is also devoted to research and innovation; therefore, in addition to its 4,300 academic staff, there are 1,600 researchers and over 470 scientific groups associated with the university who research in economic, social and human sciences, legal, technological activities, life sciences, physics, chemistry, mathematics, and the environment. Research is carried out within academic departments, in 8 research centers and 9 university research institutes.

The Applied Software Engineering (ISA) Group at US is led by Antonio Ruiz-Cortés and composed by 21 members. Its research has always aimed at finding ways to automate activities that are usually performed by hand. Currently, it spans six areas of interest including Business Process Management (BPM), Service Support, Metaheuristics, Experiments Support, Search-based Software Engineering, and Software Testing. The research on BPM aspects is led by Manuel Resinas, and it occupies 9 group members including 1 Professor, 3 Associate Professors, 4 Assistant Professors, and 3 Post-doc Researchers.

**Research Topics**

In the field of performance management, the group has strong experience in the monitoring of business processes based on process performance indicators (PPIs). The current interests involve improving the modelling, monitoring, and prediction of PPIs. Regarding modelling, the research is focused on making the definition and monitoring of decisions and unstructured processes are being devised. Finally, in the area of predictive monitoring of PPIs, the research targets problems that appear when a predictive model is deployed in a production system, such as the reliability of the models or the evolution of the predictive model.

The research on human resources covers several different angles. One stream of research focuses on the application of methodologies to improve personal productivity. This includes the analysis of the effect of techniques like mindfulness to perform cognitive-intensive tasks like conceptual modelling, and the development of novel methodologies for time management and work organization. Another research stream is focused on the configuration and use of workflow collaboration tools and other related technologies to improve the collaboration and productivity of people in the context of digital transformation.

Finally, the third research stream tackles the organizational perspective of business processes pursuing the optimization of the management of human resources along with process modelling, execution, and analysis.

The research on human resources covers several different angles. One stream of research focuses on the application of methodologies to improve personal productivity. This includes the analysis of the effect of techniques like mindfulness to perform cognitive-intensive tasks like conceptual modelling, and the development of novel methodologies for time management and work organization. Another research stream is focused on the configuration and use of workflow collaboration tools and other related technologies to improve the collaboration and productivity of people in the context of digital transformation.

Finally, the third research stream tackles the organizational perspective of business processes pursuing the optimization of the management of human resources along with process modelling, execution, and analysis.

**Current Research Projects**

- **OPHELIA. Optimization of Human-based Knowledge-intensive Services with Service-based Applications.** RTI2018-101204-B-C22. Funded by Spanish Government. 01/01/19–31/12/21. 120,625€. The objective of OPHELIA is to improve the efficiency of knowledge-intensive human-based services supported by service-based applications (SBA).

- **HORATIO. Improvements in the reliability, customization and operating costs of software services regulated by user agreements.** RTI2018-101204-B-C21. Funded by the Spanish Government. 01/01/19–31/12/21. 120,625€. The objective of HORATIO is to develop models, techniques and tools that improve the reliability, customization and operating cost of user agreement-regulated SBAs.

**CONFLICT. Integration of context-aware resource management into flexible process-oriented organisations.** RTI2018-100763-J-000. Funded by the Spanish Government.

**EXPEMENT. Performance improvement in Knowledge-intensive Processes.** An empirical approach based on people, teams, software and data. P18-FR-2895. Funded by the Andalusian Government (PAIDI). 01/01/20–31/12/22. 120,625€. The aim of EXPEMENT is to increase the efficiency of organizations by developing models, techniques and tools that help them improve the performance of their knowledge-intensive processes and the mechanisms to monitor and empirically validate these improvements.

**Awards**

Adela del-Río-Ortega, Joaquín Peña, Manuel Resinas, Antonio Ruiz-Cortés were nominated to the Best Paper Award at HICSS conference 2021 with their paper: “Productivity Challenges in Digital Transformation and its Implications for Workstream Collaboration Tools.”

Antonio Ruiz-Cortés was recognized with a Distinguished Reviewer Award at ICSE conference 2021, and Adela del-Río-Ortega received the Best Reviewer Award at CAiSE 2021.

**Events**

- Cristina Cabanillas (Universidad de Sevilla, Spain), together with Andrea Delgado (Universidad de la República, Uruguay), Aurelie Montaill (IMT Mines Albi, France) and Hernán Astridillo (Universidad Técnica Federico Santa María, Chile) organized the minitrack on “Digital Government and Business Process Management” within the HICSS 2021 conference. It was intended to be held in Hawaii, in January 2021, but due to the COVID-19 pandemic, it took place virtually.

- Adela del-Río-Ortega will be chair of the Management Track of the BPM 2022 conference that will take place in Munster, Germany. She together with Claudio di Ciccio, Remco Dijkman and Stefanie Rinderle-Ma will make up the PC chair team of the 20th edition of the most prestigious forum for researchers and practitioners in the field of Business Process Management.

**Selected Publications**


**Contact Details**

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[Image -1x651 to 595x843]
The IE Business School is one of Europe’s top providers of management education and a laboratory for new entrepreneurial ventures. IE’s Information Systems and Technology Department (ISTD) is responsible of all technology-related courses and pursues research on the transformative use and impact of digital technologies in today’s world.

The faculty at ISTD teaches courses on Digital Innovation and Technology Management in the MBA and the Tech MBA programs, manages the concentration on Digital Business in the Master in Management, and supervises the major on Information Systems in the PhD in Management and the Doctorate in Business Administration. Members of the Department have published in leading IS journals, including MIS Quarterly, Information Systems Research, European Journal of Information Systems, International Journal of Information Management, and Decision Support Systems, among others.

RESEARCH TOPICS
Research work within ISTD includes several research lines. One research line focuses on Digital Innovation, studying the interplay between organizational capabilities and digital innovation, value co-creation in digital platforms, and digital competences. A second line of research is Information Security and Privacy, investigating topics such as cybersecurity and behaviour of Spanish households, hacker behaviour analysis, computational reputation applied to cybersecurity, and the interplay among trust management, security risks and compliance. Another line of research focuses on Business Intelligence, Analytics and Machine Learning, work in this line has contributed to applying machine learning in key areas such as sustainability, Green IS, education and e-health. A final research line is Economics of Information Systems, focusing on IT outsourcing and Cloud Computing, organizational networks and the Sharing Economy, and valuation of digital innovations.

CURRENT RESEARCH PROJECTS
DIGYMATEX is an EU-funded project that aims to provide evidence-based tools to assist in understanding and determining children’s digital maturity. The project wishes to provide clear evidence on how digital maturity impacts Information and communication technologies (ICT) behaviour of children at the ages of 9–16, by maximising risks (risk factors), minimising risks (resilience factors), and maximising benefits (enhancing factors). The main two outputs of the project are two tools: The Digital Youth Maturity Index (DYM) and the DiGYou3 program. The DYM is an innovative tool that will establish and implement a comprehensive understanding and taxonomy of children’s digital maturity. The DYM will precisely measure and predict harmful and beneficial ICT-related behaviour and consequences for specific user groups. The DiGYou3-program is a technology-related solution and recommendation program, which supports the application of the DYM on three levels – individual, social and national. The program will help to improve relevant dimensions of children’s digital maturity, the development of ICT-related competencies and support the more beneficial influence on components of child development.

For more information, please visit https://digymatex.eu

EVENTS
IE hosted the SCECR 2021, the Sixteenth Symposium on Statistical Challenges in Electronic Commerce Research. SCECR is a leading workshop attracting researchers throughout the world in the areas of information systems, quantitative marketing, economics, statistics, machine learning, and computer science.

SELECTED PUBLICATIONS


For 30 years, the Institute of Information Management at the University of St. Gallen (IWI-HSG) has been dedicated to applied and design-oriented research at the interface between business and IT. Founded in 1989, the institute pursues a mixed funding approach from both public and private sources. Privately funded research at IWI-HSG is usually organized in the form of research consortia (“competence centers”). These centers, each of which includes between four and eighteen corporate partners, fall under the responsibilities of different chaired professors. In addition to its research activities, IWI-HSG lecturers engage in executive education, offering degree and non-degree programs in areas such as Business Engineering, cyber security, digital maturity and transformation, design thinking, and service innovation. Major projects in this field include the development of models and innovative prototypes. A complete list of publications with full texts of many papers is available at: https://iwi.unisg.ch/publikationen

Selected Research Topics
The Chair of Prof. Back focuses on innovative applications of new technologies covering topics such as agile innovation, cybersecurity, digital maturity and transformation, digital strategy and transformation, new work and learning, smart IoT and mobile business as well as sports digitalization. The Chair of Prof. Brenner works on designing, implementing and managing IT-enabled means of organisation and innovation. Research activities focus particularly on the future of work, service engineering and management, digital business, data-driven organisations and digital learning. The Chair of Prof. Winter focuses on understanding and designing of enterprise-wide integration, coordination and transformation problems. Major projects in this field deploy simulation, experiments, and action design research.

Selected Research Projects
A list of competence centers and current projects can be found at: http://www.iwi.unisg.ch/?id=1202

Agile Transformation: The Competence Center Agile Transformation offers a unique mix of exchange, collaboration, academic expertise, and advisory services to support the agile transformation of companies. Further information: https://agile.iwi.unisg.ch/

Digital Service Innovation: Research conducted in the context of the CC Digital Service Innovation revolves around service and business innovation. It also seeks to understand the acceptance and usage of digital services by individuals and enhance their user experience through digital nudging. Further information: https://iwi.unisg.ch/projects/dienstleis tungssysteme/

Ambidextrous Digital Platforms: This project is expected to provide a thorough description of the dynamics, determinants, and design configurations through which platform owners simultaneously manage and legitimate a balanced coexistence of top-down control and bottom-up emergence. Further information: https://www.alexandra.unisg.ch/id/project/247758

Cognitive Automation: The Competence Center Cognitive Automation combines academic insights from the forefront of cognitive automation research and advisory expertise in a platform of exchange and collaboration for practitioners. Members are enabled to seize the vast potential of cognitive automation to improve operational efficiency and effectiveness. Further information: https://cognitive.iwi.unisg.ch/

Crowdsourcing: The research goals of the Competence Center Crowdsourcing include the development of models and instruments for systematic design, introduction as well as usage of crowdsourcing approaches for digital work and IT-based innovations. Further information: http://crowdsourcing.iwi.unisg.ch

Design Thinking: The Design Thinking Group is focused on embedding human-centric innovation tools into corporate structures. The research team strives to improve the capability of corporate IT and to reduce costs and risks in innovation projects. Further information: http://design.iwi.unisg.ch

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The University of Twente is a multicultural community of talented, ambitious people that offers students, scientists, and educators from around the world the best possible conditions:

- An innovative and vibrant campus with world-class facilities for crossing boundaries and solving complex problems – including state-of-the-art facilities, such as our world-renowned NanoLab, our newly formed DesignLab, and a new Technical Medical Centre currently.
- An engineering approach to societal challenges, merging fundamental technological, and social science research with systematic solution designing.
- Core technologies, among the world’s best, in fields such as nanotechnology and biomedical engineering, IT, robotics, and geo-information science.
- Highly personal education, applying student-driven learning and project-based teamwork to foster synergy, (self-)discov-
erg, and out-of-the-box problem-solving.

An outstanding track record in value creation, starting up and spinning off new businesses (with some 1,000 successful ventures to date), and giving shape to new expressions of social and industrial engagement.

The University of Twente has ICT and Information Systems Research among its focus areas. The Digital Society Institute is one of the three multidisciplinary research institutes of the University of Twente. At the Digital Society Institute, we strive to engineer digitalization toward systems that allow for well-informed, even accountable decision-making. We achieve this by doing scientific research that contributes to solving three challenges:

**RESEARCH TOPICS**
An essential aspect of our mission is to conduct research that has an impact on society. Digitalization stretches out from creating, innovating, and developing digital technologies to adopting and crafting them to our everyday needs, desires and habits. In this way, digitalization shapes our lives by adding value and improving what we can and are willing to adopt and use for our desires and the challenges we face. The Digital Society Institute focuses on three themes:

- **Data Science and Artificial Intelligence**
  Various groups at the University of Twente conduct research on data science and artificial intelligence, including work on the fundamental understanding of machine learning, sensors, efficient utilization of artificial intelligence in hardware, to develop and application of artificial intelligence in fields such as health, safety and security, the geo-spatial domain, and manufacturing, to name a few. Central unifying themes are embedded and augmented intelligence.

- **Creating Intelligent Manufacturing Systems**
  Smart innovations in manufacturing are key to securing the welfare and wellbeing of society. Smart industry is the way forward for the industry. Using Smart Industry means personalized and smart products, optimizing human-machine interaction, yielding faster, cheaper, and more sustainable production. It means adapting business models to changing industries and services. And thus of utmost importance to maintain at the competitive edge.

- **Improving Healthcare with E-Health**
  It becomes more and more evident that the current approach to healthcare is not sustainable, especially when considering the increasing volume and demands of chronic diseases, requiring a rethink of strategies towards innovative solutions. The use of information and communication technologies in healthcare – e-Health – is a promising strategy to improve healthcare worldwide.

Excellence is a key issue. The institute’s project Living Smart Campus forms a link between all research activities, and is as such profiling for ‘Science for a Smart Society’. The Campus becomes a center of open innovation, to which also industry, government bodies, and citizens are committed.

Various departments are joining efforts in these centers to address research challenges in an interdisciplinary way. More information on the centers can be found via https://www.utwente.nl/en/digital-society/

**CURRENT RESEARCH PROJECTS**
DSI is active in dozens of research projects financed at the national and European level and directly by industry. Departments directly related to EIBIS research themes are the IEBIS (Industrial Engineering and Business Information Systems) group and the SCS (Services, Cybersecurity and Safety research group).

The IEBIS group is concerned with studying novel ways of managing business processes and supply chains using innovative techniques such as simulation, (positional) data mining, multi-agent coordination, and gamification. Researchers in IEBIS use design science methods to develop Decision Support Systems and Inter-Organizational Systems connecting networks of businesses and governments.

The goal of the SCS group is to develop methods and techniques for developing IT-based services that balance service levels with safety and security levels, and to develop methods and techniques that make existing IT-based services more secure.

Selected research projects include:
- **Data driven architecture for Predictive maintenance in the Maritime Sector** – This project focuses on the development of service logistics control towers, in a maritime setting, in which several supply chain players participate. In this joint university-industry project, we develop decision support models that integrate the planning of operations, maintenance, and resources.
- **Autonomous Logistics Miners** – This new project investigates the application of AI to autonomous logistics.
- **Circular Performance Management** – The new project studies the development of performance and recommender systems for circular products and processes across supply chains.
- **Synchronomadity** – This project aims at designing advanced algorithms and business-IT architectures to facilitate dynamic planning of logistics across various modalities. As part of the project, two PhD theses were completed and an educational game was developed to illustrate the synchronomadial concept – see https://www.truckandsundries.nl/

**AWARDS**
The Dutch Science Foundation (NWO) funded several projects for PhD and post-doctoral positions in the IEBIS department.

**EVENTS**
Due to Covid, many planned campus events went online.

In September 2021, the iCIC2021.NL, International Conference on Computational Logistics took place “virtually” in Twente. Conference that brings together researchers and practitioners working at the interface of large/complex logistics systems and advanced computational methods from the fields of Operations Research, Business Analytics, and Artificial Intelligence.

**PUBLICATIONS**


**Dissertations**
A comparative study of corporate sustain-ability, strategic corporate social responsibility and market value creation among companies operating in India, Kumar Da-modar, S., 6 May 2021, Enschede: University of Twente. 339 p., PhD Thesis.
The Leiden Institute of Advanced Computer Science (LIACS) is a centre of excellence for multidisciplinary research and education in computer science and artificial intelligence (AI). LIACS features a wide range of research, from theory to algorithms to applications, with a strong focus on artificial intelligence and data science. Within the Dutch university landscape in computer science, LIACS has positioned itself with the motto: AI4LIFE, basically meaning that modern AI methods (from optimization, deep learning, reinforcement learning, quantum computing to machine learning) are used for solving problems in other scientific domains, predominantly from the Life Sciences. This aim is pursued by LIACS researchers in leading roles in the SAILS programme, the CCLS initiative, and the European initiative for excellence in AI (Society Artificial Intelligence and Robotics).

As a consequence of our broad and international working field, we offer a complete and outstanding education. LIACS is a major institute in education for computer science. It features BSc, Master, as well as PhD programmes and a broad variety of study tracks, some of which are in collaboration with other scientific domains such as Biology and Economics. The institute has rapidly grown in the last years, and is continuing this trend. In 2021, LIACS has around 90 staff members, 95 PhD students, more than 680 bachelor students, and more than 500 master students are registered.

On Friday 3 December 2021, the SAILS Symposium “Artificial Intelligence: The Good, the Bad and the Ugly” will bring together researchers and AI stakeholders from the vicinity of Leiden University in a hybrid full day conference. The event is aimed at providing an overview of the state of research and the possibilities of practical AI use in different fields as law, archeology, drug design, humanities, and more.

For a list of current SAILS events, e.g. the SAIL lunch time seminar talks and the AI and ethics series which both are available online, see here: https://www.universiteit.leiden.nl/en/events/2021/12/sails-symposium-at-the-good-the-bad-and-the-ugly.

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The Information Systems Department has experience in managing EU-sponsored projects (TEMPUS, Erasmus+, CBHE – 5 projects, Erasmus + KA 107, Horizon 2020, AUF). The majority of Simon Kuznets Kharkiv National University of Economics Information Systems Department research activities are carried out within the following topics:

- Mobile technologies in operative management of an enterprise
- System of monitoring in scientific researches in higher education
- Fuzzy logic and modelling in logistic and marketing
- Information security
- Distributed data warehouses
- Knowledge base and artificial intelligence
- Innovative computer technologies in higher education

Current Research Projects

- ERASMUS+ CBHE EDUQAS – Implementation of Education Quality Assurance system via cooperation of University-Business-Government in HEIs. The Wider objective of the project is to improve education quality assurance systems through the development of efficient internal quality standards leading to better employability of students in Partner Countries Universities. IS department of KhNUE will work on the establishment of a QA system for bachelor and master degree programs in Information Systems.

- AUF FESU “Formation à l’entrepreneuriat social dans les universités”. The project aims at raising awareness about social entrepreneurship and its benefits around academic staff, students, and society, to promote the development of this business model, to update University strategy by incorporating social responsibility and following to Sustainable Development Goals, to implement an ICT tool to improve the level of entrepreneurial skills.

- Modern methods and means of analysis and development of information systems. The purpose of the research is to develop basic research in the field of intellectual and information-computer technologies in various spheres of human activity.

Events


Publications


182 km north of London. The campus is the largest in the UK in terms of its size, and the student population of the university is close to 20,000. The origins of the institution were in 1909 when the Loughborough Technical Institute was founded, but it was in 1966 that a university charter was granted. Since then, Loughborough University has risen in stature and is today regarded as one of the UK’s top ten universities. Since 1955, Loughborough University has had a second campus at the Queen Elizabeth Olympic Park in London.

THE DIGITALIZATION OF POLICING
Policing and criminal justice are undergoing a technological transformation. Not only has cybercrime risen greatly as a global and national threat, but the means of everyday criminal investigation are becoming digitalized. Researchers at Loughborough University are investigating the potential and issues associated with digital technology and its use for evidence gathering in the criminal justice system. Within this are the normal range of criminology endowed by society, including theft, drugs, rape, and murder, and the potential digital instruments (e.g., smartphones, Internet of Things, dashcams) have in providing evidence.

Digitalization is an area of concern to stakeholders throughout the Criminal justice system, from evidence-gathering and investigations, to trials and presentations in courtrooms. Key stakeholders and institutions are needed to debate the potential, from the state agencies to technological firms, campaign groups, and communities. There is an urgent need for knowledge-building, standards, and new solutions so that Criminal Justice enters a new era and builds standards that are relevant, secure and inter-operable across the world.

This new era is termed “Polis 4.0” by Richard Berry, PhD scholar at Loughborough. The term invites us to see that it is not just new technology that is of concern, but that there are also consequences for the whole police/public relationship. There is much at stake. Not only do police forces need to be equipped in new ways, but society needs to make decisions about the scale and nature of data that it will allow being used in the investigation of criminal cases. Research colleague Professor John Coxhead leads the development of other themes related to leadership and innovation in policing. Recently he has been leading a study of risk management related to the policing of Covid-19 in a UK police force. This is undertaken with Professor Lisa Jackson, an expert in the study of risk management perspectives in smart city research: A review and future research agenda. International Journal of Information Management, 56, 101989.


SELECTED PUBLICATIONS
References to Dr Kayode’s recent research are below:

“FAST AND FRUGAL” DECISION STRATEGIES
Studies have proposed the use of “fast and frugal” strategies as viable means in decision processes. Such strategies apply in cases where time or other operational constraints preclude the application of standard decision-analytic methods.

While there is growing evidence of how such procedures can be highly accurate, limited research has evaluated how well decision-makers can execute the prescriptive recommendations of aids based on such strategies in practice. A new paper developed by Shashwat Pande (Loughborough University), Nadia Papamichail (Manchester University), and Peter Kawalek (Loughborough University), addresses this question.

Drawing on behavioural, neuropsychological, and decision-analytic literatures, the study proposes that an alignment between individual, model, and task features will influence the effectiveness with which decision-makers can execute strategies that draw on prescriptive psychological heuristics—“fast and frugal?” or otherwise. The findings suggest that strategy execution is highly sensitive to task characteristics. The effects of the number of alternatives and attributes on individuals’ ability to deploy a given strategy differ in magnitude and direction depending on which decision strategy is prescribed. A more compensatory decision-style positively affected overall task performance. Subjects’ ability to regulate inhibitory control was found to positively affect non-compensatory strategy execution while having no discernible bearing on comparable compensatory tasks.

The findings reinforce that rather than an aspect of the prescriptive model, synergies between individual, model, and task features are more instrumental in driving task performance in multi-criteria decision-making contexts. The paper discusses these findings in light of calls from Operational Research scholars to develop decision aids that draw on prescriptive “fast and frugal” principles.
The School of Business has 66 full-time students, 150 MBA students, 80 executive programs. Within the school, the students and 3,791 undergraduate students.

Focused on research and entrepreneurship in about the institution as the College of Arts and Letters. (master’s and PhD) students, 25 PhD students, and education programs. Stevens’ three schools and one college support the mission of the Institute: The School of Engineering and Science, the School of Business, the School of Systems and Enterprises, as well as the College of Arts and Letters.

Stevens is regularly listed in the top 3% of US universities based on student return on investment. Notable graduates include Frederick Winslow Taylor, the father of scientific management, Henri Gantt, whose GANTT chart is a staple in most project managers’ toolkits, and Alfred Fielding, the inventor of the Bubble Wrap.

The School of Business has 66 full-time faculty, and 430 undergraduates, 900 MS students, 150 MBA students, 80 executive master’s students, 25 PhD students, and numerous non-degree graduate and executive programs. Within the school, the Information Systems group is among the largest graduate programs in the US, with a mix of evening and weekend classes, as well as online course offerings to students around the globe.

RESEARCH TOPICS
Within the School of Business, two IS-related research groups operate in the areas of Business Process Innovation and Decision Technologies. The Center for Decision Technologies (CDT), directed by Prof. Jeffrey Nickerson, performs funded research on topics related to decision making, combining perspectives from information systems, management science, organization science, cognitive science, social network analysis, and other computational sciences.

The Center focuses on bringing needed techniques to several areas. In the area of crowdsourcing and collective intelligence, it is now possible to quickly mobilize a crowd in minutes to address large-scale social problems. An example is ongoing research related to the open-source sharing of designs for use with 3D printers. Researchers at the CDT are interested in the role that crowds can play in sustainability—finding local solutions to energy needs that fulfill communities’ objectives. In social networks and Big Data, research at the Center focuses on the interaction of transportation and communication networks. In many recent large-scale natural disasters, social media infrastructure has proven more resilient than traditional news outlets. At the same time, rumors propagate, and inaccurate ones impede rescue and recovery, which has led to a research interest in designing social media processes that will be useful during emergencies.

The Center received funding in excess of $4 Million during the last four years from the National Science Foundation and other sources. The Center for Business Process Innovation (CEBPI) studies the interplay between business processes and the organization. Under the direction of Prof. Michael zur Muehlen, the Center’s research activities have been organized around several key issues.

The Center’s research on Business Process Analytics examines how to advance the family of methods and tools that can be applied to event streams to support decision-making in organizations. Research is also being conducted in enterprise architecture, which contains analytical or prescriptive models of organizations, to efficiently identify organizational and technical interfaces, streamline cross-functional operations, and assert compliance to rules and regulations. Researchers at the CEBPI are also interested in understanding the dynamics of digitalized design processes and the impact of digital technology on business process innovation.

Research at the CEBPI focuses on how organizations evolve in their ability to govern and change organizational work and decision-making processes. Some organizations begin by creating technical infrastructure and working out organizational adaptations. In contrast, others try to work out organizational details first before choosing appropriate technology. In either approach, the roles and responsibilities of a process support and management organization evolve over time, and little guidance exists as to how an organization can pursue operation- al efficiency in a repeatable and effective fashion.

CURRENT RESEARCH PROJECTS
Recent research at the CDT focuses on the relationship between routines and innovation in design contexts, such as those with “open-source-like” characteristics, to better understand the variables and phenomena such as routine variation, sequential structuring, structural evolution, and temporal modes as well as their impacts on design outcomes such as effective coordination, digital artifact innovation, and requirements computation.

Recent research at the CEBPI aims to understand the skills, positions, and organization structures of change management professionals in industries under different regulatory intensities. Additional research projects focus on the opportunities of digital technologies such as Robotic Process Automation, Cognitive Computing, and Blockchain in the design of business processes and the changing skills of workforce to survive in the age of smart business processes.

SELECTED PUBLICATIONS


Dissertations/Habilitation
Taathan, Ali. Three Essays in Public Capital Markets

CONTACT DETAILS
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Personal members in the ERCIS network are experts in their field of research and have strong personal connections within the network. To become a personal member, one should already have worked with partners from the network in the context of research projects, joint courses, or publications.
ABOUT ME
My research interests comprise service science, business process management, information modeling, and the socio-technical design of information systems. A particular focus is designing information systems that enable innovative service-oriented business models. I am an academic head of the Service Science Competence Center and a steering committee member of the Software Innovation Campus Paderborn (SICP). Besides other editorial roles, I am a member of the editorial board for Business & Information Systems Engineering (BISE), a guest editor for various journals, and a conference and program chair for the WI conference 2023.

SELECTED PUBLICATIONS


ABOUT ME
Patrick Delfmann is a full professor of Information Systems and head of the Research Group Corporate Communication Systems at the University of Koblenz-Landau. He holds a Diploma Degree (MSc) in Information Systems and a Ph.D. from the School of Business and Economics at the University of Münster. Patrick’s research focuses on Business Process Management Technologies and covers Process Mining, Predictive Process Analytics, Business Rules Management, Process Query, Conceptual Modeling, Ontologies, and Compliance. Currently, he supervises the three research projects “Supporting Business Process Modeling with Pattern-oriented Recommender Systems”, “Social Process Mining” and “Handling Inconsistencies in Business Process Modeling”, all funded by the German Research Foundation (DFG). Patrick’s research has been published in Journals such as Management Information Systems Quarterly, Information Systems, Communications of the Association of Information Systems, and Information Systems Frontiers, amongst others.

SELECTED PUBLICATIONS


ABOUT ME
Marco De Marco is full professor of Organisational and Information Systems at Università Telematica Internazionale Uninettuno in Rome where he serves also as Dean of the Faculty of Economics. He is the author of several books and numerous essays and articles; mainly on the development of information systems, the impacts of technology on organisations and e-government. He is a member of the editorial board of several academic journals. In 2008 and 2009 he was a Board member of the Association for Information Systems, representing Europe, Africa, and the Middle East. His main research interests have included information systems development and performance measurement methodologies, while bank information systems and their specificities were a particular study and focus. He has been serving as an officer of the major conference on information systems ICIS, ECIS, MCIS and he was co-founder of the Italian chapter of the AIS. At ICIS 2020 he was awarded the AIS Fellow Prize for his contribution to the IS discipline.

SELECTED PUBLICATIONS


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Since May 2021, I have been director of the Institute of Medical Informatics at Heidelberg University Hospital. From 2009 to 2021 I headed the Medical Informatics team at the ERCIS headquarter in Münster. My research and teaching focuses on informatics for personalized medicine, specifically information systems in healthcare. Due to the digital revolution, the relevance of informatics within all fields of health is constantly rising. There is a wide scope of applications, ranging from molecular biology over clinical medicine to public health. My specific field of interest is data modelling in medicine. I’m the principal investigator of the MDM portal (https://med-data-models.org), Europe’s largest collection of medical data models. These data models are available in 20 download formats, in particular COCIS ODM, HL7 FHIR and openEHR ADL. Personalized medicine is built upon clinical and molecular data. Therefore I’m working on data mining and pattern recognition techniques for genomic data, in particular derived from next generation sequencing of cancer tissue.

Jan Mendling is the Einstein-Professor of Process Science with the Department of Computer Science at Humboldt-Universität zu Berlin, Germany. His research interests include various topics in the area of business process management and information systems. He has published more than 450 research papers and articles, among others in Management Information Systems Quarterly, ACM Transactions on Software Engineering and Methodology, IEEE Transactions on Software Engineering, Journal of the Association of Information Systems and Decision Support Systems. He is a department editor for Business and Information Systems Engineering, member of the board of the Austrian Society for Process Management (http://process.at), one of the founders of the Berlin BPM Community of Practice (http://www.bpm.de), organizer of several academic events on process management, and a member of the IEEE Task Force on Process Mining. He is co-author of the textbooks Fundamentals of Business Process Management, Second Edition, (http://fundamentals-of-bpm.org/) and Wirtschaftsinformatik, 12th Edition, (https://lehrbuch-wirtschaftsinformatik.org/), which are extensively used in information systems education.

I am an associate professor in Information Systems at the University of Agder, Norway, where I am member of the Centre for digital transformation (CeDiT). My research focuses on the adoption of e-government both by government employees and by citizens. Furthermore, I analyse how governments interact with their various stakeholders via different communication channels. In my research, which deals with e-government on a national and international level, I combine my Information Systems background with insights from other disciplines such as communication and media science. Recently, I acquired funding for two international research projects where we identify what public services are actually suited for digitalisation.

My research is focused on the design and management of innovative information and communication technology (ICT), including artificial intelligence-based decision support systems and conversational agents, and their impact on individuals, enterprises, and society as a whole. In that context, I examine the role of explainability in AI-systems and its influence, for instance, on users’ (collaborated) trust or skill formation. Further topics refer to design and management of digital twins, the future of work and digital nudging.

Selected Publications


Exemplary Publications:


Selected Publications


Selected Publications


Selected Publications


Exemplary Publications:


ABOUT ME
Oliver Müller is Professor of Management Information Systems and Data Analytics at Paderborn University. He holds a BSc and MSc in Information Systems and a Ph.D. from the University of Münster’s School of Business and Economics. In his research, Oliver studies how organizations create value with (big) data and analytics; for example, by enhancing judgment and decision making, supporting knowledge management, or automating business processes. His research has been published in the Journal of Management Information Systems, Journal of the Association of Information Systems, European Journal of Operational Research, and various others.

SELECTED PUBLICATIONS

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ABOUT ME
I am head of the Chair for Management Information Systems & Data Analytics. Together with Alessia Maria Braccini, I lead the network’s Cluster Smart Manufacturing.

SELECTED PUBLICATIONS

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ABOUT ME
I am head of the research group „Digital Communication and Transformation“ (digital) at the University of Duisburg–Essen. My research focuses on the digital transformation, especially on the effect of novel communication and collaboration technologies on enterprises and organisations as well as on society and individuals. Based on interdisciplinary research and advanced methods of data analytics my group perform excellent research and contribute to theory and practice. We are working with selected partners from academia and industry in several projects funded by the European Union, German Research Foundation, Federal Ministry of Education and Research, industry, and foundations. My work has been published in reputable journals such as the Journal of Management Information Systems, Journal of Information Technology, or European Journal of Information Systems.

SELECTED PUBLICATIONS

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ABOUT ME
I am Senior Assistant Professor at University “G. d’Annunzio” Chieti-Pescara (Italy), where I teach “Digital Business Organization” and “Digital Transformation”. I am member of the board of advisors of the PhD program in “Accounting, Management and Business Economics”. I am the Secretary of the Italian chapter of Association for Information Systems (AIS) since 2008 (http://www.iais.org).

My research is currently focused on digital innovations and business transformation affecting people and organizations. I am also interested in the use of social network analysis techniques applied to bibliometric data for performing literature analysis. I have also recently applied these techniques to investigate the indirect interlocking directorate phenomenon.

SELECTED PUBLICATIONS

CONTACT DETAILS
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ABOUT ME
I am head of the Chair of Industrial Sales and Service Engineering in the Mechanical Engineering Department at the Ruhr-Universität Bochum. For instance, my research, Olivia studies how organizations engage in the surge of the GME Stock. International Conference on Information Systems.

SELECTED PUBLICATIONS

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ABOUT ME
I am head of the Chair for Management Information Systems & Data Analytics. Together with Alessia Maria Braccini, I lead the network’s Cluster Smart Manufacturing.

SELECTED PUBLICATIONS

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ABOUT ME
I am Senior Assistant Professor at University “G. d’Annunzio” Chieti-Pescara (Italy), where I teach “Digital Business Organization” and “Digital Transformation”. I am member of the board of advisors of the PhD program in “Accounting, Management and Business Economics”. I am the Secretary of the Italian chapter of Association for Information Systems (AIS) since 2008 (http://www.iais.org).

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SELECTED PUBLICATIONS

CONTACT DETAILS
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The ERCIS network has strong connections to local, national, and international companies working with us on various fields of expertise. Aside from sponsoring the network, the feedback of those companies during regular meetings, round tables, or during one-to-one talks, as well as their inclusion in research projects and studies, ensures that we work on practically relevant topics.
Our list of references includes over 500 company customer-centric omnichannel solutions, chains, global e-commerce platforms and chain company. We are specialists for end-customer-oriented industries such as healthcare, tech, fashion & lifestyle, beauty, entertainment, telecoms, automotive, banking and insurance.

Our vision is to be the most client focused and data/IT driven international supply chain company.

The list of our references include over 500 global market leaders, Fortune 500 companies and established brands, as well as young start-ups and expanding SMEs who rely on us to help them develop and internationalize their business models.

We believe that to develop the most efficient SCM and IT-solutions, you need to understand market demands and customer requirements. That is why we are organized in different industry segments. Our management team and their respective teams are proven experts in their fields.

The main ERCS collaboration partner in Arvato Supply Chain Solutions is our unit Arvato SCS | DIGITAL. As mentioned before, we are organized by industries. With the digital unit, we are creating competencies that dovetail the know-how with digital expertise at all levels. The basis for our digital solutions is the use and analysis of existing data.

We cultivate an open, non-dogmatic and entrepreneurial company spirit, with a strong focus on realization of SCM and IT innovations – beyond simple buzzwords. Exchange at eye level promotes a culture of creativity in the work place and strengthens teamwork within our company. This in turn helps us to act entrepreneurial and forward facing.

**JOB OPPORTUNITIES**

**Bottom-up culture & entrepreneurial spirit**

Are you looking for a career entry? Immerse yourself in the world of (digital) supply chain management and e-commerce. We offer countless entry opportunities across all career levels (from graduate programs to Senior positions) and exciting topics in our various IT and Data areas – from SAP, IT project management, software development or data intelligence to numerous opportunities in the area of digitalization in our Digital Unit.

Our strength is the interaction of different IT areas. Through exchange and cross-departmental cooperation, we can develop ever faster, ever better, innovative solutions for our customers.

You can actively contribute your ideas to our various IT topics and digitalization projects. We are looking for impulse generators and offer creative freedom in an open, relaxed and team-oriented culture. We are looking forward to getting to know you!

**At different locations (e.g. Münster, Cologne, Gütersloh, Harrewinkel, Hannover and Hamburg) we are regularly looking to fill these positions:**

- (Junior) Software Developer Java/Web
- (Junior) DevOps Engineer
- Cloud Infrastructure
- (Junior) QA Engineer / Software Tester
- (Junior) Project Manager / Product Owner
- (Junior) Data Analyst
- (Junior) Data Engineer
- (Junior) Data Scientist
- UX/UI Designers
- Management Associate Trainee
- Internships / Working Students

Please visit our career webpage for current job opportunities or feel free to submit a speculative application.

**CONTACT**

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Arvato Supply Chain Solutions is Advisory Board Member since 2019.

**RESEARCH TOPICS**

AI Solutions, Data-driven Business models, Logistics innovations & enhancements, E-Commerce

**CAREER WEBSITE**


**CORPORATE WEBSITE**

https://arvato-supply-chain.com/en

**ABOUT THE COMPANY**

As a leading supplier of merchandise management systems, Bison offers complete solutions for retail. Bison has its head quarters in Sursee, employs approximately 300 staff and generates a turnover of over EUR 70 million. With over 30 years of market experience, Bison makes a reliable, secure contribution to the success of its customers. Each customer receives comprehensive and long-term support, with a focus on mutual trust and the protection of customers’ IT investments.

Bison Smart Retail Solution was specially developed for the retail sector. This solution covers the core processes for goods management and at the point of sale in full. By developing a solution for traceability, Bison offers a modern, up-to-date package of solutions. Based on the standard solutions and individually tailored to customer preferences, considerable added value is created for the customer.

The Bison Retail expertise hub has comprehensive process knowledge and can provide and implement technical solutions, above all in all areas relating to multi-channel®. Bison Process enables a cross-channel sales approach and process management, including in-store, e-commerce and m-commerce. This industry model provides retail-specific processes. These can be individually configured to meet the company’s requirements, without programming and without losing the release capabilities of the software. The open architecture of Bison Process ensures the company a high level of investment protection; the software is always a step ahead of challenges in the market, both in terms of its technology and its functionality.

The product portfolio is complemented by POS solutions, electronic shelf labeling (ESL), mobile solutions for mobile end devices and digital signage solutions. Bison’s modern POS solution can be perfectly integrated into existing system environments thanks to the modular structure and its exceptional flexibility. Thanks to the ESL concept, the headquarters or individual branches can respond quickly to changing market or price situations. The wireless base station simplifies internal processes and creates a direct connection between the shelf and POS. In addition, the electronic shelf labelling at the POS creates new possibilities in terms of information. This is used not only for product identification and pricing labelling, but also in combination with specially developed apps or with Internet of Things (IoT) modules which provides further useful services for the customer in terms of traceability of the product, product features, contents (allergens etc.) etc. Thanks to the mobile solutions, normal Smartphone devices can be turned into powerful mobile hand-held devices. The scanning solutions include a barcode scanner, a magnetic card reader and an optional Bluetooth component to connect a mobile printer. The RFID option vastly expands the range of uses. Thanks to standard or individually programmed applications, the devices offer a multitude of in-store application possibilities, e.g. stocktaking, order creation, goods-in-process and picking.

Bison offers innovative communication options through digital signage. The solutions can be managed efficiently by the simple user functionality and automatic interfaces. Bison is a general contractor and covers all the processes of a modern retailer using integrated solutions, from the central ERP system to branch management to POS systems and digital signage.

**TOPICS OF INTEREST**

- Interest in European (sales) partnerships
- Development of new approaches to tackling retail-specific questions and problem areas bearing in mind the cloud approach
- Integration of Zebra Technologies, iPod, iPhone, iPad and Samsung Galaxy in operating procedures
- E-Paper integration options (e.g. Electronic Shelf Labeling)

**JOB OPPORTUNITIES**

For students:
Consultants, software developers, project managers and sales representatives

For graduates:
Consultants, software developers, project managers and sales representatives

For further information please visit www.bison-group.com
CLAAS

ABOUT THE COMPANY
What started in 1913 with the manufacture of powerful straw benders has become one of the world leaders in the production of agricultural technology. The company is well-known for its highest quality standards, leading technologies as well as their market leaderships in combines and self-propelled harvesters. Machine to machine communication, intelligent networking, the improvement of the harvesting process as a whole – industry 4.0 is already the company’s reality and sustainability is its principle.

CLAAS products ensure efficiency in agricultural production and they go easy on natural resources as they continuously reduce energy consumption. More than 11,000 employees are engaged in this task.

TOPICS OF INTEREST
• Connected machines
• Farming 4.0
• Omni-channel customer experience
• Precision Farming
• Data Management
• Big data & AI/ML Engineering

Today the harvest chain is seeing many innovations coming through, especially in drive technology, machine intelligence and networking. "Efficient Agriculture Systems", abbreviated as “EASY”, is the CLAAS collective term, which enables machine control and performance optimization, steering systems, precision farming and monitoring, software solutions and services. However, digital transformation has changed much more than just the technology of our machines. New product features, different license models and data driven business models require our business unit for sales and service to reinvent our traditional way of doing business.

At CLAAS, we are striving to digitalize all traditional customer touchpoints for each and every farmer. Our online and offline world is emerging into one Omni-channel customer experience. CLAAS is heavily investing in its digital future. In addition to the development center for electronics on the machines in Dissen, massive investments are being made in the customer and dealer systems. As an example CLAAS connects, as the holistic digital touchpoint, delivers integrated functionalities, services and shops to their customers in order to link the customer’s processes seamlessly with ours.

To further centralize sales processes, as well as dealer and customers systems we’ve created a new location – the CLAAS Campus Herzebrock. The well-known positive customer experience from our physical dealer touchpoints will be ensured for our digital touchpoints through the integration of state-of-the-art systems e.g. Salesforce, SAP hana, Tableau and modern IT architectures. This modern IT landscape also enables us to generate new solutions for internal processes and our customers based on data and with the use of AI. These are intended to support us in improving our products and increasing availability. Our data analytics team works closely with all departments to find new opportunities for the use of AI.

JOB OPPORTUNITIES
CLAAS is special because it is a family owned enterprise with a long-term, forward-looking approach which is based on the commitment of its employees. At CLAAS, you will face the challenging task of continuously improving harvesting performance through innovative technology.

Selected vacancies in Germany for professionals:
• SAP Consultant
• Senior SAP BW/ HANA Specialist
• Mobile Developer Android
• Network Specialist
• Security Specialist

Selected vacancies in Germany for students:
• Internship: KI in product development
• Working student position: Future CRM Sales Force
• Working student position: ITSM/ Serviceautomation

CLAAS is already powered straw binders has become one of the leading technologies as well as their agricultural technology. The company is well-known for its highest quality standards, leading technologies as well as their market leaderships in combines and self-propelled harvesters. Machine to machine communication, intelligent networking, the improvement of the harvesting process as a whole – industry 4.0 is already the company’s reality and sustainability is its principle.

TOPOGRAPHY OF INTEREST
• software engineering
• project management
• portals
• app development
• SAP HANA
• process automation
• CRM

CLAAAS, you will face the challenging task of continuously improving harvesting performance through innovative technology.

The company is already known for its highest quality standards, leading technologies as well as their market leaderships in combines and self-propelled harvesters. Machine to machine communication, intelligent networking, the improvement of the harvesting process as a whole – industry 4.0 is already the company’s reality and sustainability is its principle.

We make an active contribution to the success of the energy transition in Germany, Austria and Switzerland. With over 300 permanent consultants in 5 locations, we are the biggest independent SAP consulting firm for the utilities industry in GSA. Our success is the result of a well-balanced team formation bringing together young and experienced IT specialists, who are among the most sought-after consultants in the industry.

We are looking for talents who are interested in technology and who can think outside the box – especially in IT! Driven by innovative and creative young people, digitization accelerates the development of new technologies and new challenges. Granting young professionals the freedom to explore ideas and to assume more responsibilities is part of our credo. We maintain a strong academic network and offer attractive programs for students and graduates. Our regular workshops, graduate programs and extensive onboarding system jumpstart a career in IT development and consulting.

Find out more about our student and graduate programs:
www.cronos.de/campus
www.cronos.de/cronologewerden
ABOUT THE COMPANY
DMI

DMI takes responsibility for the digital archiving of patient records and provision in client software systems. Since 1966, the specialised service provider has been providing hospitals with continuous support in the optimisation of information-based processes and with fully compliant archiving throughout constant changes in technology and framework conditions. In production centres and at clients’ locations, DMI staff digitise, qualify, integrate and archive every second patient record for in-patients based on certified information security and data protection guidelines and ensure seamless integration into health IT systems. Through its interface expertise with all data management HIS architectures, DMI enables the consolidation of digitised paper-based patient records with electronic documents and data, as well as medical image documentation, in audit-proof long-term archives. Interoperability (the ability of systems to interact with one another), including on a data level, is the basis for the integration and sustainability of our solutions.

DMI provides its clients with lean, secure, efficient processes through consolidated patient records.

Our relationships with our clients are shaped by commitment, respect and fairness. The quality of our service business is based on the professional and social skills of our employees.

TOPICS OF INTEREST
• Consolidating medical records including electronic and digitized documents
• Interoperable IT architectures based on current standards
• Audible and digital archiving for compliance
• Deep integration of archived documents into administrative and clinical workflows for effective clinical processes for best patient outcomes
• The link between medical informatics and medical research as well as routine practice in healthcare

DMI AS AN EMPLOYER
DMI is not your typical medium-sized company: it is an owner-managed organization of roughly 1,000 highly motivated staff and a flat hierarchy. Its approach is long-term and sustainable, with continuing education of employees as a key ingredient. With a focus on the German healthcare market and additional activities in banking, insurance, general business, and the public domain, DMI offers high-value services:

• digitization, qualification, consolidation, presentation, and archiving of documents
• integration into information-based processes
• analysis of documentation process landscapes and support for optimization aiming at effectiveness and compliance.

Company headquarters are situated in the pulsating university city of Münster in North Rhine-Westphalia (NRW); service centers are located in the castle town of Leisnig near Leipzig (Saxony) and Essen (the “Green Capital”, NRW).

JOB OPPORTUNITIES
Are you up to this challenge? DMI’s team members are committed to achieving results for customers in a dynamic ecosystem of evolving technologies and continuously changing customer demands. A multitude of benefits make DMI an attractive employer.

• Selected open positions in Germany for professionals: (senior) software developers for applications, information systems specialists, experts for IT infrastructures and networks.
• Selected open positions in Germany for students: thesis students (business IT, information systems, IT, software development) for innovation in documentation and archiving enabled by state-of-the-art IT and by digital transformation.

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flaschenpost.de

ABOUT THE COMPANY
flaschenpost SE has transformed the German beverage market – by making online shopping of water, soft drinks, beer, and other beverages as simple as possible. Launched in 2016 in Münster, our company has expanded into nearly all major metropolitan areas of Germany.

Online ordering of beverages and a delivery within 120 minutes, free of charge and without crate lifting or annoying deposit returns – this is the idea that lies at the heart of flaschenpost’s customer promise. Following a consistent strategy based on both operational excellence as well as digital expertise, our company is part of a revolution in last-mile logistics.

flaschenpost’s idea was taken up and successfully multiplied by Berlin’s Durstexpress a short time later. It’s owner Oetker Group took over flaschenpost by the end of 2020 to leverage growth synergies in a dynamic growth market. The merger of both companies resulted into the leading German online beverage delivery service.

Today 33 flaschenpost logistic hubs and more than 13,000 employees are serving customers in as many as 380 German cities. And the story continues: Since last year, our range of products extends beyond beverages. By now, seven flaschenpost warehouses are delivering food, fresh goods, and household goods. flaschenpost is planning to become a nationwide full-range online grocery store soon.

To do so, we like to connect with people and institutions eager to find new solutions for e-commerce, logistics, digitalization, and sustainable mobility.

TOPICS OF INTEREST
Ever since being established, flaschenpost has been a data- and technology-driven company. Starting with a self-developed e-commerce platform and handholds that guide both delivery drivers and warehouse staff, it was our goal to be able independently implement our ideas and serve customer needs.

The connection between flaschenpost and WWU Münster is traditionally strong and has existed from the very beginnings of our company. Thus, many of our first hour employees are WWU alumni and to this day, flaschenpost actively recruits graduates. The close ties do not only relate to talent but also to scientific exchange. Therefore, we are searching for new colleagues who are smart, curious, and like to join our diverse team. Our offices in Münster, Cologne and Berlin are places where we push forward online grocery. Therefore, just get in touch with us and let us talk!

Right now, we have several positions available, e.g.:

• Senior Data Scientist (m/w/d)
• Senior Business Intelligence Analyst (m/w/d)
• Senior Data Engineer Business Intelligence (m/w/d)
• Senior Inhouse Consultant Business Intelligence (m/w/d)
• Cloud Data Engineer (m/w/d)
• Senior Analyst (m/w/d)
• Product Owner Human Resources (m/w/d)
• App-Developer Android (m/w/d)
• App-Developer iOS (m/w/d)
• Backend Developer (m/w/d) – Warehouse Logistics
• Frontend Developer (m/w/d) – Recruitment Platform

wirsindflaschenpost.de/corporate

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ADVISORY BOARD

> Advisory Board www.ercis.org
About the company
At Hilti, we create and design leading-edge technology, software and services, which power the professional construction industry. Hilti stands for quality, innovation and direct customer relationships resulting in about 270,000 individual customer contacts each day. Based in Schaan, Liechtenstein, the company has 30,000 employees in more than 120 countries around the world who contribute to making construction work simpler, faster and safer while inspiring customers every single day with technologically leading products, systems, software and services.

Many ideas for improvements are developed directly on construction sites while talking to customers. If there is an on-site challenge for which no Hilti solution exists, one will be developed. This is why the company invests approximately 6 percent of sales each year in research and development, working with top technical universities and partners, all over the world. We make our own products in Hilti factories and with external partners, making sure all our products match the same high quality and standards.

We are particularly motivated by the possibilities that digital technology can bring to a traditional sector like construction. Right now, we have a unique opportunity to solve real-world problems and lead the way in revolutionizing our industry. As a company whose lifeblood is innovation, we give our customers the next level of digital offerings on an impressive global scale.

For you, it means unrivalled opportunities to work in a “start-up within” environment, develop an international career and really have an impact on the shape of things to come.

About global IT in Hilti
It’s an incredibly exciting time to join Hilti, especially if you work in the digital space. We’ve always been a company at the forefront of engineering hardware solutions, and today we’re investing more than ever in software technologies as digital transformation is a big priority for us.

Hilti is a great place for you to show your worth as you learn, grow and carve-out your career in Information Technology. Global IT within Hilti is a truly global team with main hubs in Buchs (Switzerland), Kuala Lumpur (Malaysia), and Plano (USA). All locations have highly competent teams who work very closely together and in profound partnership with their business counterparts. Hilti’s Global IT team is known for their focus on sustainable business enablement by translating latest IT innovations into value creating solutions and services.

So, have a career with the best! Become a valuable member in a highly professional and international team of IT experts and meet the challenges of a global multinational company using latest technologies.

Topics of interest
- Business applications – where we run a fully consolidated global SAP S/4 HANA system landscape.
- Digital workplace – where we connect our 30,000 Hilti people and make them an information-enabled team.
- Cloud application platform – where we build our common platform for all digital and software offerings to our customers.
- Enterprise computing – where we design, build and operate our network and computing capabilities.

Our Global IT roles range from data analysts, project managers and system engineers to cyber security experts, user experience designers and enterprise architects.

Job opportunities in our strategic IT office in Buchs, Switzerland:
- Interns or thesis students
- Hilti Fellowship program (in cooperation with University of Liechtenstein)
- Graduate positions


Contact
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We have been recognized as one of best workplaces on the 2020 Fortune 100 Best Companies to Work For® list and 2019 Best place to Work by Glassdoor, and were invited for lots of outdoor activities and allow you to work where others spend their holidays.

IQ-Optimize
The IQ-optimize Software AG is a provider of modern, innovative software technology and offers its customers reliable and customer-oriented IT services. Since 1996 IQ-optimize develops customized applications and advanced software products. The IQ-optimize Software AG is a subsidiary of 1&1 AG. 1&1 AG is a listed public limited company and offers telecommunications services. The portfolio of the IQ-optimize Software AG is broad. The priorities are customer oriented and serve all needs of costumers.

Main competences of IQ-optimize Software AG are:
- Software development, operation and maintenance of workflow and document management systems for business processes automation, billing and media- tion, ERP and retail for web shops, stores and indirect sales including sales of subsidized goods.
- Media design for trendsetting websites.
- Implementation, hosting and operation of customized IT infrastructures and cloud solutions including service management, maintenance, security and monitoring.
- IQ Optimize is Advisory Board Member since 2004.

Job opportunities
We are offering various job opportunities within our Software Development, Billing, Operation, IT Security, Business Intelligence, Media Design and Project Management Units. Additionally to these areas we are offering job opportunities within our Cloud Technology area based on OpenStack. Please refer to https://www.iq-optimize.de/job for further details.

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tobias.zangerl@hilti.com

Notes:
1. Advisory Board: www.ercis.org
2. 1&1 AG. 1&1 AG is a listed public limited company and offers telecommunications services. The portfolio of the IQ-optimize Software AG is broad. The priorities are customer oriented and serve all needs of costumers.
3. We have been recognized as one of best workplaces on the 2020 Fortune 100 Best Companies to Work For® list and 2019 Best place to Work by Glassdoor, and were ranked among the top employers by the Great Place to Work® Institute multiple times. Further, the snow-draped mountains, crystal-clear lakes and marvelous landscapes in the so-called Happy Valley invite for lots of outdoor activities and allow you to work where others spend their holidays.

IQ-Optimize
The IQ-optimize Software AG is a provider of modern, innovative software technology and offers its customers reliable and customer-oriented IT services. Since 1996 IQ-optimize develops customized applications and advanced software products. The IQ-optimize Software AG is a subsidiary of 1&1 AG. 1&1 AG is a listed public limited company and offers telecommunications services. The portfolio of the IQ-optimize Software AG is broad. The priorities are customer oriented and serve all needs of costumers.

Main competences of IQ-optimize Software AG are:
- Software development, operation and maintenance of workflow and document management systems for business processes automation, billing and mediation, ERP and retail for web shops, stores and indirect sales including sales of subsidized goods.
- Media design for trendsetting websites.
- Implementation, hosting and operation of customized IT infrastructures and cloud solutions including service management, maintenance, security and monitoring.
- IQ Optimize is Advisory Board Member since 2004.

Job opportunities
We are offering various job opportunities within our Software Development, Billing, Operation, IT Security, Business Intelligence, Media Design and Project Management Units. Additionally to these areas we are offering job opportunities within our Cloud Technology area based on OpenStack. Please refer to https://www.iq-optimize.de/job for further details.

Contact
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HR Manager Interns
tobias.zangerl@hilti.com

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The PICTURE GmbH intends to promote organisations in their modernisation efforts. We combine a methodical approach, technical support and considerable process expertise with a sustainable qualification approach. This integrated approach helps to achieve success in process management.

The Picture method is embedded in the company’s organisational structure and serves to support process management within organisations as well as inter-site process controlling by gathering and illustrating the picture platform.

The Picture method provides the opportunity of transferring knowledge. The core business segment of the PICTURE GmbH is process consulting, process analysis and organisational design. The PICTURE GmbH is a consulting firm as well as a software company with consultants and developers specialising in process consulting. The company is well known for the PICTURE method and with consultants and developers specialised in process consulting.

As Provinzial Group we belong to the Savign Banks Finance Group, Germany’s leading and most successful financial network. We are one of Germany’s top 50 insurers with a premium volume of more than six billion Euros and around 5,400 employees. The Provinzial Holding AG as holding company of the whole group is headquartered in Münster. In total, there are five regional indemnity and casualty insurers as well as two life insurers operating under the holding company with headquarters in Münster, Düsseldorf, Kiel, Hamburg and Detmold.

For more information, visit us on www.provinzial-konzern.de/content/karriere or follow us on www.provinzial-konzern.de
SAP’s strategy is to help every business run as an intelligent enterprise. As a market leader in enterprise application software, we help companies of all sizes and in all industries run at their best: 87% of the world’s total global commerce touches an SAP® system. Our machine learning, Internet of Things (IoT), and advanced analytics technologies help turn customers’ businesses into intelligent enterprises. SAP helps give people and organizations deep business insight and fosters collaboration that helps them stay ahead of their competition. We simplify technology for companies so they can consume our software the way they want – without disruption. Our end-to-end suite of applications and services enables business and public customers across 25 industries globally to operate profitably, adapt continuously, and make a difference. With a global network of customers, partners, employees, and thought leaders, SAP helps the world run better and improve people’s lives.

For more information, visit www.sap.com

TOPICS OF INTEREST
Business Technology Platform
• Database & Data Management
• Intelligent Technologies
• Application Development
• Predictive Analytics
• Artificial Intelligence / Machine Learning
• Blockchain
• Cyber Security / Quantum Technologies

Intelligent Suite
• Digital Supply Chain
• Industrie 4.0 / IoT
• Employee Experience Management
• Sustainability Footprint Management

The guiding principles of the Schwarz IT are enthusiasm for innovation, proximity to people and understanding the business. As a leading technology partner, the Schwarz IT is the digital heartbeat of the Schwarz Group: efficient, fast and flexible.

TOPICS OF INTEREST

JOB OPPORTUNITIES
Dreamers, Thinkers, Doers. Looking for your dream job? Find it at SAP. Bring everything you are – and become everything you want.

For more information, visit jobs.sap.com

The Schwarz Group is a leading international trading company with 500,000 employees in 33 countries and 12,900 stores worldwide. Based in Neckarsulm, Baden-Württemberg, Germany, the Group’s pillars in food retailing are Lidl and Kaufland.

In addition to the retail business, the Schwarz Group has continuously expanded its portfolio: The Schwarz Production produces own brands in the beverages, baked goods, confectionery and ice cream sector.

The Schwarz Group has been involved in the collection, sorting and recycling of recyclable materials for many years. PreZero is the disposal and recycling service provider for the entire group.

Schwarz IT is the powerful technology partner of the entire Schwarz Group. As a central IT service provider, Schwarz IT is responsible for the selection and provision of IT infrastructure, IT platforms and business applications.

By continuously considering current technological developments, Schwarz IT identifies innovative courses of action. In close cooperation with the departments, Schwarz IT develops professional, efficient IT solutions. In total, Schwarz IT is responsible for IT at more than 12,900 locations throughout the Schwarz Group in 33 countries en-route to “Trading 4.0”.

Schwarz IT – more IT than you might think! Find out about attractive job offers at www.it.schwarz

Goals: The Schwarz Group is among the top retailers worldwide with annual sales over 125,3 billion euros. The digitization of the world offers many previously unimagined possibilities for the further development of existing business models and for the establishment of completely new concepts. For this to succeed, we create the decisive technological prerequisites.

The Schwarz IT secures the diverse, global daily business of the Schwarz Group. Through the forward-looking development of innovative solutions, the Schwarz IT enables new business ideas to be put into practice.

Become part of Schwarz IT, the powerful technology partner of Schwarz Group. The Schwarz IT offers a variety of opportunities from internships to permanent positions for go getters, who want to become part of the digital heartbeat.

www.xing.com/companies/schwarzitkg
www.linkedin.com/company/schwarz-it-kg
www.kununu.com/de/schwarz-it
viadee is a German IT company with more than 260 employees including interns. Our company culture is dedicated to caring for each one individually, maximizing our potential. Applying this principle, we have come a long way since 1993 to offer great individual solutions to our customers.

viadee currently has an office in Münster, as well as an office in Cologne and Dortmund. We focus a regional customer base in North-Rhine Westphalia. Projects are seldom far away from our employee’s home location, which proudly makes us say that most of our consultants have the chance to sleep at home. This contributes to our flexibility, family lives as well as to our CO₂ footprints.

The industry sectors, in which our consultants are active, include banking, electric power industry, trade, IT and service companies, logistics, public service, telecommunications, insurers, and supply plants.

**Topics of Interest**

We share a passion of technological and methodical expertise. Keeping up to date with the ever-changing world of IT, there are various opportunities to grow within viadee.

Bringing BPMN (business process model notation) models to life is currently one of our core activities. Prominent mention should be given to our Open Source contributions on GitHub, as well as our contribution BPMN-Modeler on the Atlassian Marketplace. Work often is organized in agile projects leveraging Java- or Cloud-based technologies, be it new technologies like Quarkus and Micronaut or Spring Boot, or established practices like WSDL or REST. Java and SAS have accompanied us through almost all our company history and with most customers. However, we emphasize our undogmatic view on technologies and methods and use whatever is appropriate, such as Python and R in the Data Science domain.

To keep up with the scientific discussion we enjoy cooperation, both with ERCIS, and other research institutions.

Test automation is great to ensure software quality. We feel it is even greater with a Test automation and RPA framework: to make the next step? if you see yourself in a technical role, while being open and interested in the social components of everyday business life, we would love to welcome you on board.

**Job Opportunities**

Interested in our topics and ready to take the next step? if you see yourself in a technical role, while being open and interested in the social components of everyday business life, we would love to welcome you on board.

**IT-Consultants for**

- Software Development
- Software / Cloud Architecture
- BI / Data Science
- BPM and Process Automation

To find out about our benefits and further job listings make sure to visit our website www.viadee.de/karriere.

For a closer look at our field of interest, you are invited to follow along at blog.viadee.de – a blog to which every employee can add content.

**For More Information, Please Contact:**

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@viadeeJava
www.viadee.de

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**About the Company**

The Westfalen Group is an energy sector technology company operating with numerous subsidiaries and associates in Germany, Belgium, France, the Netherlands, Austria, Poland and Switzerland. The family business, founded in 1923, has over 20 production sites located across Europe and is headquartered in Münster. Its business sectors are gases, energy supply and service stations. With almost 1,800 employees, the Westfalen Group posted sales of around 1.6 billion euros in the 2020 financial year.

**Gases**

The Westfalen Group produces and distributes approximately 300 technical gases and gas mixtures for almost every application in industry and trade, food production, laboratories, pharmaceuticals, medicine and homecare.

**Energy Supply**

Under its Westfalenagas brand, the Westfalen Group is one of Germany’s leading liquid gas supply companies. There are more than 2,000 possible applications for Westfalenagas: as off-grid thermal energy for heating factories and agricultural buildings, for thermal processes in industry and commerce, or as an environmentally friendly propellant for passenger cars or forklift trucks.

**Service Stations**

With around 260 stations, the Westfalen Group has the largest independently branded filling station network in Germany, primarily in North-Rhine Westphalia and Lower Saxony. In addition to conventional fuels, Westfalen and Markant stations also offer the alternative energies of LPG, charging current and hydrogen.

**A Family Owned Company**

The Fritsch-Albert family ensures continuity of the family company: Since July 2018, Wolfgang Fritsch-Albert has been Chairman of the Supervisory Board at the Westfalen Group. Prior to this, he led the company as CEO from 1977 to 2018. Renate Fritsch-Albert joined the Supervisory Board in April 2017. She was previously a member of the Executive Board.

**Climate Protection with Hydrogen**

The Westfalen Group supports regional and nationwide environmental protection initiatives. In 2018, for example, it entered into a cooperation with Stadttelauto Car-Sharing Münster GmbH. Both companies offer an emission-free hydrogen vehicle to rent. In October 2021, the Westfalen Group presented the mobile hydrogen filling station, a future technology that it intends to bring to the German market together with its cooperation partner Nanosun.

**Systematic Energy and Environmental Management**

The Westfalen Group has, for many years, continued to pursue a rigorous energy and environmental management system. In 2018 the effectiveness of this system was proven once again by the company’s successful certification to internationally recognized standards DIN EN ISO 14001 and DIN EN ISO 50001.

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**Top Topics of Interest**

- Industry 4.0
- IoT in Logistics
- Data Analytics and Machine Learning
- Mobile Solutions
- Business Process Excellence
- Digital Business models

Westfalen is constantly on the lookout for new business fields and technologies in order to continue to establish forward-looking products on the market. By strengthening entrepreneurship, the first start-up ideas have been put into practice, including the mobile payment app fillibri and the sustainability platform Sustayn.

**Job Opportunities**

If you are interested to work with great people at the Westfalen Group please look at our website: https://westfalen.com/de/de/karriere/
Advisory Board

zeb is the leading strategy and management consultancy specializing in financial services in Europe. We support banks, insurance companies and (tech) service providers in dealing with all the challenges and opportunities arising from transformation in the industry. As an employer, we rely on people who like to try new things, take responsibility and inspire others through their actions.

Topics of Interest
As a partner for change, it is our aim to improve the performance and competitive strength of our clients. The success of our consulting services is based on well-founded methodology, combined with in-depth expertise and excellent knowledge of the sector. The focus of our work lies in strategy & organization, finance & risk and IT. We intend to continue our growth path in the future. Our thematic growth focus is on management and IT consulting.

Additional Information
#ShapeSpaces
Entering new spaces, shaping and designing them, grasping and changing the unknown. That’s our thing. We love to discover new things, try them out and develop them further—and we love to infect others with our enthusiasm for doing so.

Shape Spaces expresses the key element of the zeb culture: shaping things. With expertise, courage and creativity, we drive the transformation of the financial sector forward. We love to discover new things, try them out and develop them further. We are looking for people who overcome boundaries, shape the future and infect others with their enthusiasm.

Shape your professional future with us.

Stay and grow
“Stay and grow” is our motto. zeb promotes long-term careers—with a focus on your personal career path. We are looking for people with an excellent university education and team spirit. Our principle at zeb: reasoning beats hierarchy. This means that your opinion matters. Get involved in the dialog that gives rise to something new. Listening well is just as important as arguing convincingly. Question the familiar and inspire others with your ideas. Create new solutions in a team and dive deep into the topic.

Job Opportunities
Required specializations:
- business administration, economics,
- (business) informatics, (business) mathematics, applied physics

Possibilities to join the company:
- Internship
- Student assistant
- Theses and dissertations
- zeb.bachelor.welcome
- Direct start

www.zeb-career.com/de/
www.zeb-career.com/en/
The ERCIS network bundles certain areas of expertise in several competence centers. Competence centers are multi- and interdisciplinary consortia consisting of partner institutions from research as well as from practice to focus on distinct topics.
The Competence Center for Conceptual Modeling focuses on the development of novel methodologies, providing automatic support for the design, enactment, and analysis of conceptual models (largely process models) in different business domains. Our research is mainly based on formalisms, models and algorithms from graph theory, machine learning, propositional logic, natural language processing, ontologies, and software engineering.

**CONCEPTUAL MODELING**

The Competence Center for Conceptual Modeling focuses on the development of novel methodologies, providing automatic support for the design, enactment, and analysis of conceptual models (largely process models) in different business domains. Our research is mainly based on formalisms, models and algorithms from graph theory, machine learning, propositional logic, natural language processing, ontologies, and software engineering.

**RESEARCH**

**Business Rules Management:** Business rules are formal prescriptions that a company has to comply with in order not to face negative monetary or legal effects. Business rules are used to control the execution of business processes, and they are often maintained in business rule repositories as part of process-aware application systems such as business process management software and/or workflow management systems. An important task of Business Rules Management is to maintain said repositories in order to cope with inconsistencies, for instance.

In our research project “Handling Inconsistencies in Business Process Modeling (HIBPM),” which is funded for two years by the German Research Foundation (DFG, DE 1983/3/2), we have developed a methodology that can identify such inconsistencies automatically and support analysts in resolving them with corresponding inconsistency measures and visualizations.

**Process Modeling:** Process Mining is a popular research stream in the realm of Business Process Management. It develops approaches to learn the structure and behavior of a business process automatically from log files of business software. Traditional Process Mining focuses on highly structured processes as they are typically executed in enterprise systems or semi-structured processes, which are supported, for instance, by case handling systems. A new research field in Process Mining, which we initiated with our research project “Social Process Mining (SPM),” focuses on unstructured processes as we find them in Enterprise Social Software (ESS). The goal of the SPM-project, which is funded for three years by the German Research Foundation (DFG, DE 1983/2/2), is to develop Process Mining algorithms that consider the special character of unstructured processes and to apply them on large ESS log data to automatically detect typical collaboration scenarios in ESS.

**Predictive Process Monitoring:** Predictive Process Monitoring is used to learn the structure and behavior of a business process automatically from log files of business software and predict the future behavior of currently running process instances. The prediction results can be used to proactively influence process instances, for example, to assure beneficial behavior and avoid unfavorable one. We can use predictive process analytics, for instance, to support public traffic systems or tourist installations to optimise their operating rate or to avoid congestion, optimize the behavior and output of plants, or decrease fine particulate matter pollution in major cities.

**Process Modeling Recommender Systems:** Recommender Systems provide automatic support for process modelers by recommending next and/or previous process flow and annotation elements during the modeling process. The recommendation is made based on the information found in the process modeled so far and based on a repository of process models and/or process ontologies commonly used in the domain. To calculate recommendations we make use of ML methods that were transferred from the field of Predictive Process Monitoring (see below). To avoid ambiguities in the naming of process elements, we use terminological standardisation based on Natural Language Processing (NLP). A corresponding research project “Supporting Business Process Modeling through Pattern-based Recommender Systems (ProPoneRe)” started in December 2021 and is funded for two years by the German Research Foundation (DFG, DE 1983/2/2).

Currently, we are co-organising the new minitrack “Business Rules Management Technologies” at HICSS 2022, together with our ERCIS colleagues from KU Leuven. We are happy that we could acquire several high-class papers so that we could meet the strict acceptance rate criteria of HICSS while at the same time being able to completely fill up the minitrack time slot. Another track that we are currently organising, together with colleagues from the Universities of Kiel and Rostock, is the BPM track at the International Conference for Business Information Informatik 2022.

In teaching, we offer an annual winter school, called the Ski-Seminar, for bachelor and master students, which is organised by the University of Koblenz and the ERCIS headquarters. The winter school takes place in the Austrian Alps, so we can offer skiing as a social event.

**SELECTED PUBLICATIONS**


**CONFERENCE & TEACHING ACTIVITIES**

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**getID Model**

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The Competence Center for Crisis Management (C³M) integrates the research efforts of the ERCIS network in the domain of crisis management (CM) and humanitarian logistics. Our main objective is to identify relevant challenges in practitioner realities and to design appropriate socio-technical solutions. C³M integrates a collaborating network of different practitioners and research organisations from the CM and humanitarian logistics domain.

Current Research Projects

- Our DRIVER+ project, which ended last year, was selected as one out of ten #brightsideof2020 EU projects by the European Research Executive Agency. A direct continuation of the DRIVER+ activities is realised through the H2020 funded C³M project. The third ongoing project picks up our partnership with stakeholder workshops with representatives from Ghana and Namibia.

- The third ongoing project project picks up our simulation activities directly related to the COVID-19 pandemic. The project “Epi-PredICT” project aimed at developing an agent-based model for Pathogen-specific Modelling of Epidemics, funded by the Federal Ministry of Education and Research, aims at the development of a testbed to evaluate non-pharmaceutical intervention strategies for a deeper understanding of infection dynamics. Together with our domain experts from science and practice and the German COVID-19 modelling initiative, we have been engaged in researching the dynamics of the COVID-19 pandemic and supporting public health decision-making.

C³M TEACHING AND OTHER ACTIVITIES

We offered several CM-related courses to the Münster IS students, such as the specialisation module “Quantitative Methods and Simulation in Humanitarian Logistics” or project seminars on simulation for pandemic management or enterprise architecture management in blood supply chains.

We would like to emphasise our first joint student project with the Institute for Fire Services of North Rhine-Westphalia as it fitted so well to the virtual setups of our lectures since the COVID-19 outbreak. Our partners were challenged by an increasing demand for more intensified and flexible work in its command chains. Our students conceptualised and prototyped a virtual command and control system for fire fighters. The applied Human-Centered Design methodology impressively led the project team to a well-evaluated practitioner-driven solution. Besides, we again organised the course “Logistics in Humanitarian Action” offered by the Network on Humanitarian Action (NOHA) at the group of Prof. Dr. Dennis Dijkstra, Institute for International Law of Peace and Armed Conflict (Radboud University Bochum). Given our established collaboration, we were invited to cover now the humanitarian logistics chapter in the new edition of the NOHA International Humanitarian Logistics Textbook.

WHAT’S NEXT?

We would like to close with some good news for 2022. We were granted with two new projects starting soon: (1) The project "SpaceImpact", funded by the German Research Foundation, investigates the utilisation of spatially resolved data sources for an agent-based model of Germany and its impact on predicted SARS-CoV-2 dynamics. (2) The project "DigCBA", funded by the Research Council in Norway, contributes to the responsible use of digital cash-based assistance in refugee crises. As DigCBA is led by Associate Prof. Husein Bahamand from our ERCIS partners at the University of Agder, Norway, we are very happy about both the growth of C³M and its stronger integration within the ERCIS network. Last but not least, C³M has been invited to participate in the FoAn project led by the Federal Agency for Technical Aid (THW) as associate partners. FoAn brings together German CM and security practitioners with organised research institutions to intensify their active involvement in European civil security research. Big thanks to all our partners and a warm welcome to all new collaborators!

SELECTED PUBLICATIONS


DIGITAL TRANSFORMATION IN SMEs

Despite the obvious hurdle of the pandemic, for meetings, we have managed to uphold a decent level of activities. Here is an overview. We hope to be able to host events for CCDT associates, and other interested parties, in the year to come!

Representatives from the VOIL partners (picture, fig. 2), have met in Portugal and participated in the presentation of the VOIL platform for European businesses, sept. 29th 2021. The venue was CeiiA – Centre of Engineering and Product Development that designs, develops, and operates innovative products in the mobility industries, namely Automotive and Urban Mobility, Aeronautics, Ocean, and Space. 37 people participated on site, and 149 participated online.

VOIL is a platform assisting small and medium sized enterprises in achieving digital transformation. It has been developed as an Erasmus+ project by 9 European universities and organisations. In the picture below (fig. 2), we see Nekane Aramburu (University of Deusto, Bilbao), Niels Garmann-Johnsen (University of Agder, Kristiansand), and Isabel Ramos (University of Minho, Guimaraes), who presented the different VOIL modules.

Submitted projects in 2021:


H2020-SwafS-2018-2020 “Open Science For the digital transformation of Circular BusIness moDelS”. FOCUSSED overall objective is to engage citizens in the demonstration of environmental solutions in their daily life and, thus, contribute to provide a rich and co-created informational environment involving citizens to inspire environmentally friendly consumer behaviours.

The ERCIS members involved are University of Minho (PI-coordinator), Tallinn University of Technology (EE), Alessio Braccini – Universita Degli Studi Della Tuscia (IT), University of Agder (NO), University of Twente (NL), University of Turku (FI).

Evaluation: 8/10 – not approved but ideas from this proposal may be reused later!

PUBLICATIONS


Seven people have presented their works at CCDT/ERCIS events in Portugal and submitted the following projects in 2021:


If you are interested in our work, have ideas, or you would like to collaborate with us, please do not hesitate to get in touch with us!

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NIELS F. GARMANN-JOHNSEN
University of Agder, Norway
niels.f.garmann-johnsen@uia.no

https://ccdt.ercis.org/
The E-Government Competence Center brings together members of the ERCIS network working on digitalisation in the public domain. Our research covers a broad range from individuals’ use of e-government technology to e-participation to process management.

eGov-Campus

at the University of Münster

Public service delivery becomes increasingly digital making e-government endeavours more and more important. However, the public sector still faces a lack of personnel with sufficient IT competence to master this enormous challenge. To overcome this problem, the research project “eGov-Campus”, started in 2020 intending to build up a nationwide e-learning platform for e-government so that public officials can join the platform for digital upskilling by attending MOOCs. The first course went online in 2021, was about process management in the public sector and held fully virtual. CC eGov will be participating in community activities again next year: Together with Nils Urbach, Frankfurt University of Applied Sciences, and Moreen Heine, Bettina Distel again organises an e-government track for the upcoming Wirtschaftsinformatik Conference to be held in Nuremberg-Erlangen – hopefully in person again!

SELECTED PUBLICATIONS


International Project on Public Service digitalisation

Researchers from the University of Agder, Norway, together with colleagues from IT University in Copenhagen, Linkping University, and University of Oslo, are working on two research projects that identify what public services are suitable for digitalisation. The first project, funded by the Norwegian welfare agency, focuses on the citizens’ perspective on digital public services. The second project, which is funded by the Norwegian research council, also considers the organisational perspective for giving recommendations on what public services should be digitalised.

NEGZ-Study

The German National E-Government Competence Centre (NEGZ) has funded a joint research effort between the CC eGov and the Lorenz-von-Stein-Institut for Verwaltungswissenschaften (Institute for administrative sciences), Kiel. The study investigates opportunities and implementation challenges of a digitalisation check in the legislative process in Germany. Such a check would test novel legislative initiatives towards their digital enforceability, executability and their meaningfulness. The study sheds a light on the subject from a central perspective (i.e. in the course of implementing new laws) as well as from a decentral perspective (relevant aspects for norm-executing authorities) and helps politicians and lawmakers to better understand the impact and implications of new laws in a digitised world and society. The research process has been very fruitful as the ERCIS researchers could contemplate the topic from an As-point of view, whereas the CC eGov-colleagues brought in the legal expertise. The publication is expected in Q2 2022.

CLAIRe & ERCIS Partnership

ERCIS has partnered with the CLAIRe network in 2021. In September 2021, ERCIS took a leading role in CLAIRe-organised so-called Theme Development Workshops, in which researchers from different fields, AI experts and domain experts came together to build visions and high-level research agendas. In this case, members of the ERCIS CC eGov led sessions to carve out, how AI can help in public service delivery and along the way to a No-Stop-Shop public administration. We elaborated and set up a list of open research questions, which will now further develop into potential research and research collaboration roadmap. Thus, the workshops have been very promising in becoming a fruitful partnership in the future and ERCIS is looking forward to deepen the relationship.

Master’s Program Public Sector Innovation and E-Governance (PIONEER)

PIONEER is a joint master programmeorganised by the KU Leuven, the University of Münster, and TallTech University Tallinn providing the students with interdisciplinary expertise. The fourth cohort has attended the summer term in Münster. Due to the COVID19 pandemic, it was again a completely virtual semester. While missing the personal discussions in the lecture rooms we of course got more and more used to the online-only formats. While the fourth cohort has moved to Tallinn now having its first physical semester — the fifth cohort with 18 students started in Leuven, and Muenster is awaiting them in April 2022.

Study on process management in the public sector

It is widely accepted that business process management is an important building block for the digitalisation and modernisation of the public sector. Nevertheless, the research process management is applied to very different extents in public administration. Therefore, based on a survey of over 700 participants, the CC eGov examined the current state of process management in Germany’s public administration. The study provides insights into the application, spread, and extent of process management across all federal levels and cover, for instance, a BPM competence gap. Although, the participants rated BPM competence as very important for executives but also usual public officials simultaneously state that this competence is not widely spread among public administrations. The full text is accessible under https://doi.org/10.17879/58009602234.

E-Government and Smart City Tracks at the Wirtschaftsinformatik Conference and dg.o

As in previous years, the CC eGov was again involved in the community with conference tracks. Under the leadership of Robert Krimmer, Hendrik Scholta, and Bettina Distel, the track “Digital Sovereignty in the Era of Smart Cities” was organised at this year’s (virtual) dg.o conference, and together with Moreen Heine of the University of Lubeck, Bettina Distel organised the track E-Government for this year’s Wirtschaftsinformatik Conference, which was also held fully virtual. CC eGov will

be participating in community activities again next year: Together with Nils Urbach, Frankfurt University of Applied Sciences, and Moreen Heine, Bettina Distel again organises an e-government track for the upcoming Wirtschaftsinformatik Conference to be held in Nuremberg-Erlangen — hopefully in person again!

SELECTED PUBLICATIONS


International Project on Public Service digitalisation

Researchers from the University of Agder, Norway, together with colleagues from IT University in Copenhagen, Linkping University, and University of Oslo, are working on two research projects that identify what public services are suitable for digitalisation. The first project, funded by the Norwegian welfare agency, focuses on the citizens’ perspective on digital public services. The second project, which is funded by the Norwegian research council, also considers the organisational perspective for giving recommendations on what public services should be digitalised.

NEGZ-Study

The German National E-Government Competence Centre (NEGZ) has funded a joint research effort between the CC eGov and the Lorenz-von-Stein-Institut for Verwaltungswissenschaften (Institute for administrative sciences), Kiel. The study investigates opportunities and implementation challenges of a digitalisation check in the legislative process in Germany. Such a check would test novel legislative initiatives towards their digital enforceability, executability and their meaningfulness. The study sheds a light on the subject from a central perspective (i.e. in the course of implementing new laws) as well as from a decentral perspective (relevant aspects for norm-executing authorities) and helps politicians and lawmakers to better understand the impact and implications of new laws in a digitised world and society. The research process has been very fruitful as the ERCIS researchers could contemplate the topic from an As-point of view, whereas the CC eGov-colleagues brought in the legal expertise. The publication is expected in Q2 2022.

CLAIRe & ERCIS Partnership

ERCIS has partnered with the CLAIRe network in 2021. In September 2021, ERCIS took a leading role in CLAIRe-organised so-called Theme Development Workshops, in which researchers from different fields, AI experts and domain experts came together to build visions and high-level research agendas. In this case, members of the ERCIS CC eGov led sessions to carve out, how AI can help in public service delivery and along the way to a No-Stop-Shop public administration. We elaborated and set up a list of open research questions, which will now further develop into potential research and research collaboration roadmap. Thus, the workshops have been very promising in becoming a fruitful partnership in the future and ERCIS is looking forward to deepen the relationship.

Master’s Program Public Sector Innovation and E-Governance (PIONEER)

PIONEER is a joint master programme organised by the KU Leuven, the University of Münster, and TallTech University Tallinn providing the students with interdisciplinary expertise. The fourth cohort has attended the summer term in Münster. Due to the COVID19 pandemic, it was again a completely virtual semester. While missing the personal discussions in the lecture rooms we of course got more and more used to the online-only formats. While the fourth cohort has moved to Tallinn now having its first physical semester — the fifth cohort with 18 students started in Leuven, and Muenster is awaiting them in April 2022.

Study on process management in the public sector

It is widely accepted that business process management is an important building block for the digitalisation and modernisation of the public sector. Nevertheless, the research process management is applied to very different extents in public administration. Therefore, based on a survey of over 700 participants, the CC eGov examined the current state of process management in Germany’s public administration. The study provides insights into the application, spread, and extent of process management across all federal levels and cover, for instance, a BPM competence gap. Although, the participants rated BPM competence as very important for executives but also usual public officials simultaneously state that this competence is not widely spread among public administrations. The full text is accessible under https://doi.org/10.17879/58009602234.

E-Government and Smart City Tracks at the Wirtschaftsinformatik Conference and dg.o

As in previous years, the CC eGov was again involved in the community with conference tracks. Under the leadership of Robert Krimmer, Hendrik Scholta, and Bettina Distel, the track “Digital Sovereignty in the Era of Smart Cities” was organised at this year’s (virtual) dg.o conference, and together with Moreen Heine of the University of Lubeck, Bettina Distel organised the track E-Government for this year’s Wirtschaftsinformatik Conference, which was also held fully virtual. CC eGov will

be participating in community activities again next year: Together with Nils Urbach, Frankfurt University of Applied Sciences, and Moreen Heine, Bettina Distel again organises an e-government track for the upcoming Wirtschaftsinformatik Conference to be held in Nuremberg-Erlangen — hopefully in person again!
The mission of the ERCIS Service Science Competence Center is ERCIS’ primary unit for conducting research and industry projects in the area of service management and service engineering. The team currently consists of two professors, one executive, and 17 research assistants. The proliferation of the Service Economy has changed the way in which the creation of value is perceived through various industry sectors and societies. Selling products is increasingly replaced by customized service offerings and alternative revenue streams (e.g., power-by-the-hour). Research in the academic discipline of Service Science, Management and Engineering is focused on understanding and facilitating the creation of value in service systems, involving interactions of service providers and service customers. The mission of the ERCIS Service Science Competence Center is twofold. On the one hand, we strive to understand the nature and impact of service orientation on companies, which can be analysed with Process Mining. Process Mining is established for mass transaction processes. However, it has rarely been applied to analyse knowledge-intensive processes such as product development. Knowledge-intensive processes leave fewer data traces in event logs, while they also exhibit more process variants than standardised processes. The objective of the BPM-I4.0 project, which is funded by the state of NRW, is to extend the applicability of process mining for knowledge-intensive processes in industry by designing and implementing innovative tools. We prototype our solutions at two companies (Westmuller Interface GmbH & Co KG; GEA Westfalia Separator Group GmbH) and cooperate with a software vendor (CONTACT Software GmbH) of a Product-Lifecycle-Management (PLM) system and a software vendor (CONTACT Software GmbH) of a Product-Lifecycle-Management (PLM) system. During uncertain events such as natural disasters or human-made crises, social media communication plays an increasingly important role for citizens and emergency service agencies. RISE_SMA attempts to uncover communication patterns and suggest best practices to seek and share information in precarious situations.

Business processes are the organisational core of companies, which can be analysed with Process Mining. Process Mining is established for mass transaction processes. However, it has rarely been applied to analyse knowledge-intensive processes such as product development. Knowledge-intensive processes leave fewer data traces in event logs, while they also exhibit more process variants than standardised processes. The objective of the BPM-I4.0 project, which is funded by the state of NRW, is to extend the applicability of process mining for knowledge-intensive processes in industry by designing and implementing innovative tools. We prototype our solutions at two companies (Westmuller Interface GmbH & Co KG; GEA Westfalia Separator Group GmbH) and cooperate with a software vendor (CONTACT Software GmbH) of a Product-Lifecycle-Management (PLM) system. During uncertain events such as natural disasters or human-made crises, social media communication plays an increasingly important role for citizens and emergency service agencies. RISE_SMA attempts to uncover communication patterns and suggest best practices to seek and share information in precarious situations.

**Business Process Mining for Industry 4.0 (BPM-I4.0)**

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**Selected Publications**


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For Industry 4.0 (BPM-I4.0)
**COMPETENCE CENTERS**

**SMARTER WORK**

New technologies are increasingly used in dynamic organisations and change how work is organised and performed. The COVID-19 pandemic accelerates the development of hybrid work arrangements, integrating distributed and collocated work. While such arrangements increase employees’ flexibility in terms of work hours and work locations, they also add to the complexity of organisational structures.

“Smarter Work” describes an approach of designing these new ways of working, supported by communication and collaboration systems, with a strong emphasis on the well-being and productivity of all actors involved. We help to exploit the potentials of new working modes by means of conscious and coordinated use of technologies, aligning digital and analogous work.

The Competence Center Smarter Work supports organisations with the introduction, use, and management of new communication and collaboration systems. We build on years of experience with transformation processes. We integrate individual and organisational perspectives in our research, laying organisational problems as a basis for actionable suggestions. We combine a broad repertoire of methods (e.g., surveys, interviews, physiological measurements, digital forensics) with traditional and innovative theories, enabled by our interdisciplinary team of scientists from business, computer science, psychology, sociology, as well as practitioners from industry.

**SELECTED RESEARCH PROJECTS**

- **From Enforced WFH to Hybrid Work**
  (PIs: J. Mattern, S. Lansmann, S. Krebber)
  “Reflect on your experiences during the working from home (WFH) phase. What worked well? What worked not so well?” These and more questions were answered by the global IT department from Hilti to give insights into how knowledge workers perceived the sudden shift to “enforced WFH” due to COVID-19. Our goal is to understand the particularities while working fully remote and the effects for individual conceptions as well as organisational designs of the future (hybrid) work. A large share of participants stated that they perceived themselves as being (far) more productive. Taking into account their specific task structures and job profiles, we analyse the factors that influence employees’ perceived productivity and how these affect their desired extent of working from home in the future.

- **Interplay between Individual and Collaborative Work**
  (Pis S. Lansmann, I. Schaltheuner, R. Haines)
  Building on the experience gained during the COVID-19 pandemic, we investigate how multi-project knowledge workers engage in individual work. Our participants work in a hybrid work setting, that is, they work at least one day per week from home. We are interested in (a) the role individual work plays in their job, (b) how they plan for individual work, and (c) how periods of individual work interact with collaborative work. Based on this, we conceptualize individual work patterns and their interplay with collaborative work in order to understand how they complement or conflict each other. Secondly, we explore how knowledge workers choose to work from home or the office in light of the complementarity of individual and collaborative work.

- **Influence Mechanisms in Bitcoin**
  (PIs: R. Thapa, J. Hüllmann)
  Research on the Bitcoin blockchain suggests that the inner-working of Bitcoin is not decentralised. Building on these findings, we examine the mediated communication of the Bitcoin members and identify Bitcoin influencers who are central to the activities in Bitcoin. While enacting new Bitcoin network rule changes, the influencers use different tactics and persuade other members to agree to their desired Bitcoin network rule changes. As such, Bitcoin influencers impact the Bitcoin network governance and ultimately influence the community governance. Specifically, we identify the way key members exert influence in permissionless blockchain communities.

- **People Analytics**
  (PIs: J. Hüllmann, S. Krebber)
  People analytics is a trending topic that depicts data-driven decision-making by the human resources function to improve organisational procedures such as hiring, employee development, or staffing. Driven by commercial software vendors and service providers, the market segment of people analytics’ tools and services can be characterised as opaque with respect to the collected data and employed algorithms. To shed light on this market segment, we conducted two studies looking at people analytics tools and consultancy services. We provide a novel classification of people analytics, contributing to our understanding of how vendors and consultants vary in goals, collected data, and algorithms. The studies further elaborate on the novelty and implications, e.g., privacy, performance, and validity, of these new people analytics’ classes.

- **AI in Farming**
  (PI: J. Hüllmann)
  Understanding the integration of artificial intelligence (AI) systems into joint human-AI decision-making requires research that looks beyond AI in laboratory settings and into the application of AI in practice. Targeting the empirical context of agriculture in North Rhine-Westphalia, our research inquires the joint figuring of human and AI decision-making through interviews and observations. This research is in its early stages, and the data collection is upcoming. It will take place at a demo farm, a living laboratory facilitating a real-world setting for the co-production of knowledge. Implications of the research include more accessible AI systems, easing transfer into practice, as well as increasing human control.

The research results will lead to improved AI-based decisions in farming. Through co-development on the farms, we contribute to improving the usability and integration of AI systems into the farming practice.

**SELECTED PUBLICATIONS**


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**COMPETENCE CENTER**
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www.ercis.org
The Competence Center Social Media Analytics (CC SMA) continues – and since this year in close collaboration with the Topical Programme on Algorithmization and Social Interaction as well as the AlqMedia project – to deal with challenges due to the rapid and often disruptive evolution of social media technology. The main research focus of the CC SMA is the misuse of social media technology for disinformation, propaganda, and fake news distribution. The (international) partners approach the topic from the different angles of their respective disciplines: computer science, psychology, statistics, journalism and media, communication science, as well as mathematics.

EXTENDING THE NETWORK AND COLLABORATION

The Topical Programme on Algorithmization and Social Interaction (https://algorithmization.org/) has been established with funding by the University of Münster and with support of existing and new partners of the CC SMA. It provides a networking platform for international exchange on the broader topics of how algorithms affect humankind on an individual and global level as well as how the increasing algorithmization of society can be regulated in the future. Together the CC-SMA and the Topical Programme have initiated a talk series and benchmarking in this research domain. The paper emerged from a discussion and workshop at the ERCIS Annual Meeting 2019. Further, members of the CC-SMA collaborated with other outstanding representatives of the SMA-community to highlight the problem of data quality and benchmarking in this research domain published in Social Science Computer Review. During the German federal election (Sept. 2021), members of the CC-SMA worked as research partners of the Federal Ministry of the Interior and transferred newly developed methods for monitoring social media to discover and prevent automated attacks (i.e., social bots). In October 2021, the federally funded collaborative project Hybrid, involving three CC-SMA partners, will begin investigating the detection and classification of disinformation strategies.

CONTINUING THE MISDOOM

SUCCESS STORY

Members of the CC SMA supported the Oxford Internet Institute in organising the now third edition of the Multidisciplinary International Symposium on Disinformation in Open Online Media (https://www.ai4media.eu/). The AlqMedia project is a new Center of Excellence, which supports next-generation AI research with a special focus on media, society, and democracy. Besides being a platform of research, application, and exchange on the European level, AlqMedia is also a hub for European AI research and application funding. Members of the CC-SMA will participate in the first open call for research project proposals.

RESEARCH ON SMA: METHODOLOGY, PROJECTS, AND APPLICATION

Led by ERCIS colleagues from Loughborough, the CC-SMA contributed in a position paper published in the International Journal of Information Management) on the European perspective on AI and Humankind. The paper emerged from a discussion and workshop at the ERCIS Annual Meeting 2019. Further, members of the CC-SMA collaborated with other outstanding representatives of the SMA-community to highlight the problem of data quality and benchmarking in this research domain published in Social Science Computer Review. During the German federal election (Sept. 2021), members of the CC-SMA worked as research partners of the Federal Ministry of the Interior and transferred newly developed methods for monitoring social media to discover and prevent automated attacks (i.e., social bots). In October 2021, the federally funded collaborative project Hybrid, involving three CC-SMA partners, will begin investigating the detection and classification of disinformation strategies.

PUBLICATIONS

Many members of the CC SMA have published multiple papers on disinformation identification, algorithmization as well as on methodological issues:


**SHORT NEWS**

**CHANGES IN INSTITUTIONAL PARTNERSHIPS IN ITALY AND ESTONIA**

The network always evolves and this, of course, includes changes. Thus, from 2022 on, the institutional member in Italy will be the University of Viterbo with Prof. Alessio Maria Bracci. We thank Prof. Paolo Spagnonetti from LUISS in Rome for his engagement in the network over the last years and he will stay connected as personal member. In Estonia, Prof. Robert Krimmer moved from the Tallinn University of Technology to the University of Tartu and joined the ERCIS membership with him. Thus, the University of Tartu is now the ERCIS partner in Estonia.

**NEW COLLEAGUES AT THE UNIVERSITY OF TWENTE**

Information systems is expanding and we have welcomed several new faculty in Information systems research at our university: Dr. Daniel Braun and Jan Willem Bullee joined in 2021.

**RESEARCH STAYS AT THE UNIVERSITY OF TWENTE**

In 2022, positions are again available for Visiting Researchers in the area of Business Information Systems – University of Twente – short visits (2-12 weeks): ERCIS members are especially invited to spend a research visit in Twente. We are happy to offer furnished accommodation on our wonderful campus. Research visits open for junior and senior IS faculty.

**NEW MEMBERS IN THE NETWORK**

We are always delighted to welcome our youngest members in the network: Daniel and Levi (2021), Mia (2020), Vito (2020). Great to have you with us and we are looking forward to meeting you all in person! Furthermore, Mikkel joined the network (in 2020 already), making everyone feel just a bit better.

**JULIAN VARGHESE SUCCEEDS MARTIN DUGAS AS ERCIS DIRECTOR**

Prof. Dr. Martin Dugas left the University of Münster in 2021 and heads a new Institute for Medical Informatics at Heidelberg University Hospital. Univ.-Prof. Dr. Julian Varghese, MD, is his successor in Münster and, thus, our new member at the ERCIS Headquarters. Martin Dugas stays connected to the ERCIS network as a personal member.

**ERCIS – CLAIRE: MEMORANDUM OF UNDERSTANDING**

2021, the European Research Center of Information Systems (ERCIS) joined forces with CLAIRE (Confederation of Laboratories for Artificial Intelligence Research in Europe) in terms of a Memorandum of Understanding. The collaboration will specifically bundle and foster application-oriented AI research and related activities. First joint activities took place already, for example in the context of the upcoming Joint Theme Development Workshops, organized by CLAIRE together with the EU ICT-48 Networks of Excellence. Especially the planned Theme Development Workshop for the public sector was a successful event, once more emphasizing that digitization of public administration is a prominent field of research in Information Systems (IS), and this sector is highly relevant for addressing some of CLAIRE’s top priorities: Contributing to AI for Good and AI for All.

The parties strive to furthermore encourage direct contact between the members of their organizations. Possible forms of cooperation include joint research activities, specifically in the context of the European Commission’s Framework Programmes; application-oriented research, aimed at bridging the gap between academia and industry; joint involvement of respective members in consortia, commissions, or panels; co-organization and participation in lectures, seminars, workshops, and conferences; and the exchange of academic materials, academic publications, and information. A further focus is the inclusion of highly skilled PhD students in network activities for young AI researchers.
GERMAN AI PRIZE AWARDED TO CLAIRE INITIATIVE

For outstanding contributions to research, development, application of artificial intelligence, the CLAIRE initiative co-founded by Holger Hoos of LIACS, Leiden University, was awarded the German AI Prize on October 1st. The prize is endowed with 100,000 euros and shared with the ELLIS initiative (European Laboratory for Learning and Intelligent Systems).

The Confederation of Laboratories for Artificial Intelligence Research in Europe (CLAR, https://claire-ai.org) is an organization created by the European AI community that seeks to strengthen European excellence in AI research and innovation, future growth and competitiveness, physical and virtual stores are increasingly connected to each other and to the outside world (smartphones, RFID chips, NFC payments, digitalization of the point of sale, augmented reality, etc.), creating a new proximity with consumers. The Chair follows and studies the phenomena of consumption and retail such as influenced, modified or slowed down by the IT focusing on the digitalization of companies and the evolution from multichannel to omnichannel; the e-Fulfillment systems in multichannel retailing.

"BUSINESS IN A CONNECTED WORLD" CHAIR AT KEDGE

Businesses witness today the end of the duality between traditional commerce and e-commerce as the boundaries between digital and non-digital are blurring. Physical and virtual stores are increasingly connected to each other and to the outside world (smartphones, RFID chips, NFC payments, digitalization of the point of sale, augmented reality, etc.), creating a new proximity with consumers. The Chair follows and studies the phenomena of consumption and retail such as influenced, modified or slowed down by the IT focusing on the digitalization of companies and the evolution from multichannel to omnichannel; the e-Fulfillment systems in multichannel retailing.

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DATA ANALYTICS FOR BUSINESS – NEW MSc PROGRAMME AT KEDGE

AI, machine learning and business analytics techniques are taking an increasingly important role in companies, allowing them to invent and create new, value-generating businesses. However, as these technical specialities expand, it appears that a crucial link is missing: professionals who can build bridges between data scientists and the various business functions of the organization. KEDGE BS opens a new MSc programme based on three pillars of knowledge of the company's business activities and major functions to ultimately use the applications.

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APPLE DEVELOPER ACADEMY AND MANUFACTURING R&D SUPPORT CENTER

Apple will open the first Apple Developer Academy and Manufacturing R&D Support Center in South Korea in 2021 at Pohang University of Science and Technology (POSTECH). The Apple Developer Academy and Manufacturing R&D Support Center will support public education as part of Apple’s significant investment to enhance economic development and innovation across regions. In addition, the Manufacturing & R&D Support Center will contribute cutting-edge training on the latest smart and green technologies for SMEs across the country. The center will also provide small and medium-sized enterprises (SMEs) opportunities to upgrade their technologies, processes, and products by directly connecting Apple’s experts and equipment.

NEW CURRICULA AT THE UNIVERSITY OF GDANSK

Since October 2016 – a new innovative specialization – Business Informatics has been released on Bachelor studies. It is a specialization made in cooperation with business partners that were involved in programme creation. Since the last semester, the studies are carried out in the dual mode – two days a week of studies at University and three days a week internship in Pomerania IT firms cooperating with the specialization within Panel of Business Partners. Starting from October 2021 – a new specialization has been released on Masters Students – Business Informatics, all courses are provided in English. Mostly foreign students enrolled to this specialization. Additionally, the department of Business Informatics successfully finalized the grant regarding cooperation between industry and academia, in the form of student traineeships in IT firms, mostly international IT corporations. Due to the prolonged threat of a pandemic, most of the classes are conducted remotely using the MS Teams conference software and the Educational Portal of the University of Gdansk Mestwin.
In 2021, the Liechtenstein Chapter of the AIS (LCAIS), received the AIS Outstanding Chapter Award 2020 for achievements in research, teaching, and knowledge transfer. The LCAIS is among the 41 AIS Communities to earn the designation of Outstanding SIG, College or Chapter for 2020.

BUSINESS PROCESS INTELLIGENCE (BPI) TOUR BY SIGNAVIO AND SAP
Prof. Jan vom Brocke had the great pleasure to host and moderate the Business Process Intelligence (BPI) Tour by Signavio and SAP in 2021. The purpose of this virtual event was to bring industry experts, thought leaders and customers together, to present and share high-quality business transformation insights. Several topics were covered, such as: Migration to SAP S/4HANA, the power of data-driven decision-making, the need for ongoing transformation and increasing productivity with the right solutions.

5TH TETHICS CONFERENCE IN TURKU
The conference Technology Ethics – Tethics entered to its fifth edition in year 2021. It was held at 20.-22.10.2021 as a hybrid event.

This book is a sequel and extension to the book “Business Process Management Cases”, published in its first edition by Springer in 2018, which has been downloaded for more than 50 million times. This book, in collaboration with Prof. Dr. Jan vom Brocke, Prof. Dr. Jan Mendling and Prof. Dr. Michael Rosemann (members of the ERCIS network & editors of this book), is a collection, which is dedicated to providing a contemporary and comprehensive, industry-agnostic insight into the realities of BPM. In particular it focuses on the lessons that only authentic cases can provide. The experiences documented cover both, the positive impact of deploying BPM as well as the lessons learnt from failed attempts. Each case takes a holistic approach and by doing so, each chapter recognizes that BPM in practice is a multidimensional endeavor covering strategy to operations, systems and infrastructure, governance and culture, models and running processes.
The ‘RISE_SMA’ project (funded by the EU Horizon 2020 research and innovation program), coordinated by Stefan Stieglitz, aims at developing solutions for contemporary challenges for Social Media Analytics in the context of society and crisis communication. The international and interdisciplinary network involves partners from the University of Duisburg-Essen (Stefan Stieglitz), University of Agder (Tim A. Majchrzak), the Queensland University of Technology (Ariel Bruns, Jean Burgess), University of Leiden (Michael Emmerich, Suzan Verberne, Frank Takes) and from the municipality of Kristiansand, Norway (Sigurd Paulsen). The COVID-19 pandemic posed a challenge for the project which thrives from sharing knowledge during research stays at the respective locations. At the same time, the pandemic illustrated the relevance of understanding social media communication during crises as many used social media to share and receive information about the disease. With a special focus on investigating COVID-19-related misinformation on social media, an international focus group was initiated by Tim Majchrzak within the RISE_SMA network.

**Publications**


**Scientific collaboration between Leiden University and Wuu Münster**

Leiden University and Wuu Munster continued their successful collaboration within the ERCIS on topics of social media, artificial intelligence, and multicriteria decision making. Several joint publications emerged from this collaboration also in 2022:

The dissemination event was attended by transnational project meeting 5 SMEs that presented the transformation project in Portugal (VOIL) companies and higher education students. An event was held in CEiiA on September 27th, as part of the project’s closing activities they are responsible for. The project took place from the 27th to September 29th, in the city of Matosinhos, Portugal.

On the 27th, the companies that participated by videoconference are:
- Estudios Durero (www.estudiosdurero.com, Spain), represented by Begóna Portela.
- AVL List GmbH (www.avl.com, Austria), represented by Eric Amengaud.
- Schneider Electric Portugal (www.se.com), represented by Inês Rodrigues.
- Wakaru Consulting (www.wakaru.eu, Portugal), represented by João Mugeiro.
- PeekMed (www.peekmed.com, Portugal), represented by João Pedro Ribeiro.

Marcus Cramer from Eyducated (https://edyoucated.org/) addressed the development of digital skills assisted by intelligent algorithms. At the end of the day, those present in the room were challenged to a brief dynamic ideation session based on the Lotus Blossom technique. The audience in the room was around 40 participants. Virtually, the number of participants varied between 50 and 150 throughout the day.

The University of Liechtenstein is leading an Erasmus+ funded project on explorative business process management (BPM). In cooperation with the Vienna University of Economics and Business and the University of Bayreuth, a reference module is developing different aspects of explorative BPM. This is important because BPM activities are mostly concerned with operational efficiency and overlook opportunities for innovation. Particular focus is placed on the role of digital technologies. The project will result in a reference module including a set of various lectures and recommendations on how explorative BPM can be taught in Europe and beyond.

Together with the University of Bayreuth, and the Vienna University of Economics and Business, the University of Liechtenstein is working together on the Erasmus+ funded project “Developing Process Mining Capabilities at the Enterprise Level”. Digital technologies affect all areas of contemporary work. They support, replace or augment human work, and they require special skills and competencies by those who use them. Process mining is a fast-growing technology concerned with managing and improving business processes. The potentials associated with process mining are vast and the market is estimated to grow tenfold over the next ten years. Yet, there is little knowledge about how to adopt, use and manage this digital technology. This is important, however, because despite its potentials, it is often reported that process mining leads to misuse or discontinuance of use altogether. Hence, our work intends to support practitioners, and future students, in understanding, estimating, and managing the implications of process mining.
SEMANTIC ANALYSES OF MEDICAL DATA MODELS AT THE UNIVERSITY OF MÜNSTER

This eLearning seminar is a joint teaching module by the Institute of Medical Informatics and the Department of Information Systems of University of Münster. It is an online course with intense supervision (4 supervisors, 5 students from the Department of Information Systems, 7 external students or medical informaticians from the HiGimed partners of the Medical Informatics Initiative) including lectures, writing and presenting a scientific seminar thesis. It facilitates practical skills for semantic analyses of medical data models and the generation of common data elements in different disease domains. The module will cover the concepts of semantic interoperability, research data standards such as the Operational Data Model by the Clinical Data Interchange Standards Consortium (CDISC ODM), metadata standards such as the ISO 11197. Based on the FAIR (Findable, Accessible, Interoperable, Reusable) guiding principles for scientific data management, the participants will be familiarized with a metadata platform for finding, accessing, creating interoperable and reusable medical data models to generate harmonized data elements.

PHD PROGRAM OF UNIVERSITY OF LIECHTENSTEIN AND HILTI

The University of Liechtenstein and Hilti have developed a joint PhD program that provides a unique opportunity for students to drive their academic ambitions while setting a cornerstone for a professional career. Students in the program will work on innovative and impactful projects in Hilti, from which they will be able to draw valuable inputs for their research. The program is designed to challenge and support the students to grow their professional talents and to succeed in completing the doctorate requirements. MSc graduates that are fulfilling the general admission criteria for a PhD program at the University of Liechtenstein and that are interested in building a foundation for a career at Hilti, Master’s students from ERCIS member institutions are welcome to apply for this program.

COURSES AT THE UNIVERSITY OF ST. GALLEN AND LUCERNE

Prof. Dr. Jan vom Brocke gave several courses and modules at the University of St. Gallen. Since 2007 he has been giving courses in Design Science Research, Information Management in the PhD study program in Management. Since 2012, he has offered a 5-days course on Business Process Management in the Executive MBA in Business Engineering. Also, he provided a 3-days module in Process Management (“IT Business Manager”). At the University of Lucerne, he also gave courses in Business Process Management in the Master’s degree program.

VIRTUAL BPM WINTER SCHOOL 2021

In February 2021, information systems students from different European countries had the opportunity to attend a virtual version of the BPM Winter School. This event was a joint event of the Hilti Chair of Business Process Management at the Institute of Information Systems of the University of Liechtenstein with chairs in the ERCIS network. It was open to students from ERCIS member institutions. Besides lectures on advanced and state-of-the-art BPM topics, virtual networking sessions, and fun events were included in the agenda. This event addressed many aspects of Digital Transformation via BPM. For example, Prof. Dr. Jan vom Brocke gave a course on Process Science, Prof. Dr. Daniel Beverungen talked about Organizational Routines, and Prof. Dr. Martin Matzner presented the topic Process Mining.

VIRTUAL PHD SEMINAR ON “DESIGN SCIENCE RESEARCH”

Since 2011, Prof. Dr. Jan vom Brocke (University of Liechtenstein) and Prof. Dr. Robert Winter (University of St. Gallen) have been offering a joint PhD course on “Design Science” as part of the VHB-ProDok course program. Being forced to virtualize the course because of the COVID-19 restrictions, Jan vom Brocke and Robert Winter redesigned the course syllabus so as to be compatible with distance learning. While in previous years about 15 PhD students could take part in the on-site physical course, the online format attracted about 60 participants from Europe (many of them from the ERCIS network), the United States, and New Zealand and it has been offered three times in 2020 and three times in 2021. Born out of necessity, the virtual format allowed more interested students to participate and helped to increase the visibility and reach of the course.

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HILTI FELLOWSHIP PROGRAM

The Hilti Fellowship offers excellent students the opportunity to be part of an international project team at Hilti while they attend lectures and seminars in the Master’s program in Information Systems at the University of Liechtenstein. The Hilti Fellowship is primarily aimed at Master’s students from fields like information systems, business, and management; however, doctoral students and Bachelor’s students who will complete their studies in the near future and plan to pursue a Master’s degree in the following semester can also apply. Because of visa regulations in Liechtenstein, the program is open to EU/EEA and Swiss citizens. Therefore, this program is of great interest for students of ERCIS member institutions. Participants work on real projects at Hilti three days a week and attend the Master’s program in Information Systems on the other two days.


The course (https://algorithmization.org/) is offered virtually and investigates the role of AI from the perspectives of economy, ethics, computer science and law. Students from various disciplines, and coming from different countries, at the level of MA and PhD are invited to take part in this format.

ALGORITHMIZATION AND SOCIAL INTERACTION

Course offering within the topical program “Algorithmization and social interaction”.

SERIES OF LECTURES BY INTERNATIONAL PROFESSORS AT THE UNIVERSITY OF GDANSK

Professors Mante Kirikova, University of Riga and Jaze Zupancic, University of Mari- bor gave a series of videoconference lectures for the students of the new specialization Informatic Applications in Business.
The University of Agder hosted the 16\textsuperscript{th} DESRIST conference which was a hybrid conference with both physical present- and online participants. The aim of the conference this year was to support the DSR community in finding its role in the next wave of sociotechni- cal design. It is a need for taking the context of social and technological advances into account with blurring organizational boundaries, platformization, and the use of artificial intelligence. The conference brings together researchers and practitioners engaged in all aspects of design science research, with a special emphasis on sociotechnical design aspects.

**Collaboration with SAP Signavio:**

The BPM Billboard

In collaboration with SAP Signavio, Prof. Dr. Jan vom Brocke and his colleagues Prof. Dr. Jan Mendingl, and Prof. Dr. Michael Rosemann, presented the BPM Billboard in several webinars, hosted by SAP Signavio. In addition to presenting the BPM Billboard, company representa- tives were invited to report on its use and share best practices with a broad audience. The BPM Billboard is a tool for planning, communicating and coordi- nating process initiatives and provides practitioners with a clear representation of all the important aspects that should be taken into account for the planning and further development of their BPM initiative.

**13\textsuperscript{th} International Conference on Computational Collective Intelligence (HybrICCCI 2021)**

29 September – 1 October 2021, Rhodes, Greece

The 13\textsuperscript{th} International Conference on Computational Collective Intelligence (ICCCI 2021), was held in Rhodes, Greece, during September 29 – October 1, 2021. Due to the COVID-19 pandemic the conference was organized in a hybrid mode which allowed for both on-site and on- line paper presentations. The conference was hosted by the Democritus University of Thrace, Greece, and jointly organized by Wrocław University of Science and Technology, Poland, in cooperation with the IEEE SMG Technical Committee on Computational Collective Intelligence, the European Research Center for Information Systems (ERCIS), the University of Piraeus, Greece, and the International University-VNU-HCM, Vietnam.

We received over 230 papers submitted by authors coming from 45 countries around the world. Each paper was reviewed by at least three members of the international Program Committee (PC) of either the main track or one of the special sessions. Finally, we selected 60 best papers for oral presentation and publication in one volume of the Lecture Notes in Artificial Intelligence series and 58 papers for oral presentation and pub- lication in one volume of the Communications in Computer and Information Science series.

**Workshop Series on Digitalization**

For the first time, the University of Liech- tenstein is organizing the workshop series “Digitalization” starting on October 2021 until February 2022. This series is open to academics, practitioners, and stakehold- ers from public organizations, supporting the transformation of their organizations, their country and beyond. The lecturers will present basics of digitalization, funda- mental concepts of digital innovation, the explanation and benefits of artificial intelligence, the transformation of organi- zations through business process manage- ment, and cyber security including aspects of cybercrime.

**ICIST 2021 – 27\textsuperscript{th} International Conference on Information and Software Technologies**

October 14–16, 2021, Kaunas, Lithuania

ICIST is organised by Kaunas University of Technology and is one of the longest run- ning IT research conferences in Lithuania. Building on the positive experience from the 2020 iteration, ICIST 2021 focussed on the four research areas, namely:

- Intelligent Methods for Data Analysis and Computer Aided Software Engineering
- Intelligent Systems and Software Engineering Advances
- Smart e-Learning Technologies and Applications
- Language Technologies

The conference featured 2 keynote speech- es and 30 paper presentations. The pro- ceedings were published by Springer as a part of Communications in Computer and Information Science (CCIS) series. Traditionally, ICIST includes a special session on relevant topics, and this year was no ex- ception with 11 additional talks and demos being presented by the KTU educators and practitioners from the major local IT com- panies on the topic on Creating Talents in Software Engineering.
The MOBA workshop continues the tradition of organizational and business models. Eduard Babkin, an Ordinary Professor at the National Research University Higher School of Economics, Head of the Theory and Practice of Decision Support Systems, became the chairman of the new MOBA workshop. Pavel Malyzhenkov, Associate Professor of Business Informatics from HSE with many years of experience in participating in the EOMAS seminar, the leaders of the new MOBA scientific seminar are confident that it will bring together leading researchers and practitioners in Business Informatics and become an active platform for discussion of the results of modern research at the international level. The list of seminar organizers includes leading scientists and practitioners in the field of modern Business Informatics: Joseph Banjis (Lecturer at the University of San Jose and Stanford, USA), Robert Pergl and Wojciech Merunka (Technical University of Prague, Czech Republic), Russell Lock (University of Loughborough, UK). The fruitful joint work in the organizing committee is based on the long-standing acquaintance of Business Informatics from HSE with these specialists: Joseph Banjis attended HSE Nizhny Novgorod with lectures for students and participated in the “Days of Organizational Engineering”, Robert Pergl and Wojciech Merunka are colleagues of Nizhny Novgorod Business Informatics on the international workshop EOMAS.

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CO-ORGANIZATION OF THE STUDENT TRACK AT THE 16TH INTERNATIONALE TAGUNG WIRTSCHAFTSINFORMATIK

For about 10 years, the University of Liechtenstein has supported the Student Track at the 16th Internationale Tagung Wirtschaftsinformatik. The goal of the Student Track is to give students – especially from the ERCIS network and beyond – the opportunity to actively participate in this conference and submit research papers. The Student Track provides a platform through which students, researchers and practitioners can get to know each other in professional discourse. The best student paper will also receive the Best Student Paper Award from the Liechtenstein Chapter of the Association for Information Systems (AIS) and Hiitl.

8TH INTERNATIONAL CONFERENCE ON INFRASTRUCTURES IN HEALTHCARE (InfaHealth 2021)

23–24 September 2021, University of Agder, Kristiansand, Norway

University of Agder hosted the 8th Infra-Health conference. The main theme of the conference this year was Digitalization and Personal Health Data. The focus was on personal health data and their use through new types of applications including artificial intelligence. The increased availability of personal health data requires new ways of organizing health services. The conference brings together international researchers, healthcare professionals, IT professionals, administrators, and IT enterprises. Keynote presentations focused on Digital Transformation of the health care sector, and Digital transformation and change during crisis: from Telemedicine to Medicine.

13TH ASIAN CONFERENCE ON INTELLIGENT INFORMATION AND DATABASE SYSTEMS (ONLINE ACIDIS 2021)

7–10 April 2021

ACIDIS 2021 was the 13th edition of the Asian Conference on Intelligent Information and Database Systems. The aim of ACIDIS 2021 was to provide an international forum for research workers with scientific backgrounds on the technology of intelligent information and database systems and various applications. The ACIDIS 2021 conference was co-organized by King Mongkut’s Institute of Technology Ladkrabang (Thailand) and Wroclaw University of Science and Technology (Poland) in cooperation with the IEEE ISMC Technical Committee on Computational Collective Intelligence, the European Research Center for Information Systems (ERCIS), the University of Newcastle (Australia), Yeungnam University (South Korea), Leiden University (The Netherlands), Universiti Teknologi Malaysia (Malaysia), BINUS University (Indonesia), Guang Binh University (Vietnam), and the “Collective Intelligence” section of the Committee on Informatics of the Polish Academy of Sciences. ACIDIS 2021 was at first scheduled to be held in Phuket, Thailand during April 7–10, 2021. However, due to the COVID-19 pandemic, the conference was moved to the virtual space and conducted online using the ZOOM videoconferencing system.

The proceedings of ACIDIS 2021 were published by Springer in series Lecture Notes in Artificial Intelligence (LNCS/LNAI). We received in total 291 papers whose authors came from 40 countries around the world. Each paper was peer reviewed by at least two members of the international Program Committee and one member of the international board of reviewers. Only 69 papers of the highest quality were selected for oral presentation and publication in this LNAI volume of the ACIDIS 2021 proceedings.
### OUTLOOK FOR 2022

#### JANUARY 2022

**ERCIS BPM WINTER SCHOOL 2022**, 10–14 January, University of Liechtenstein, [https://www.ercis.org/education/ercis-bpm-winter-school](https://www.ercis.org/education/ercis-bpm-winter-school)

#### MARCH 2022

**START AND KICK-OFF HILTI FELLOWSHIP PROGRAM** (Summer term 2022), [https://careers.hilti.li](https://careers.hilti.li), [https://www.uni.li](https://www.uni.li)

#### APRIL 2022

**DAGSTUHL PERSPECTIVES WORKSHOP ON “AI VS BIG DATA, DATA SCIENCE AND ROBOTICS: Synergies and Distinguishing Elements”**, 3–8 April, Schloss Dagstuhl, Wadern, Germany, [https://www.dagstuhl.de/22142](https://www.dagstuhl.de/22142)


#### MAY 2022

**ERCIS DOCTORAL CONSORTIUM**, 28 May–4 June, Pto. Pollensa, Spain, [https://www.ercis.org/dc](https://www.ercis.org/dc)

#### JUNE 2022

**14TH ASIAN CONFERENCE ON INTELLIGENT INFORMATION AND DATABASE SYSTEMS (ACIIDS 2022)**, 6–9 June, Almaty, Kazakhstan, [https://aciids.pwr.edu.pl/2022/](https://aciids.pwr.edu.pl/2022/)


#### JULY 2022


#### AUGUST 2022

**FINANCECOM 2022**, 23–24 August, Enschede, The Netherlands

**13TH INTERNATIONAL CONFERENCE ON MULTIMEDIA & NETWORK INFORMATION SYSTEMS (MISSI 2022)**, 31 August–2 September, Pans, France, [https://missi.pwr.edu.pl/2022/](https://missi.pwr.edu.pl/2022/)

#### SEPTEMBER 2022

**ERCIS ANNUAL WORKSHOP**, 12 September, Münster, Germany, [https://www.ercis.org](https://www.ercis.org)

**20TH INTERNATIONAL CONFERENCE ON BUSINESS PROCESS MANAGEMENT (BPM)**, 13–15 September, Münster, Germany, [https://bpm2022.uni-muenster.de](https://bpm2022.uni-muenster.de)

**14TH INTERNATIONAL CONFERENCE ON COMPUTATIONAL COLLECTIVE INTELLIGENCE (ICCCI 2022)**, Hammamet, Tunisia, [https://iccci.pwr.edu.pl/2022/](https://iccci.pwr.edu.pl/2022/)

**PARALLEL PROBLEM SOLVING FROM NATURE (PPSN) CONFERENCE**, Münster, Germany

**14TH EUROSYMPOSIUM ON DIGITAL TRANSFORMATION**, Gdansk, Poland, [www.eurosymposium.eu](http://www.eurosymposium.eu)


#### OCTOBER 2022

**28TH INTERNATIONAL CONFERENCE ON INFORMATION AND SOFTWARE TECHNOLOGIES (ICIST 2022)**, 13–15 October, Kaunas, Lithuania, [https://icist.ktu.edu](https://icist.ktu.edu)

**CAPS2022 – CONFERENCE OF THE PORTUGUESE ASSOCIATION FOR INFORMATION SYSTEMS**, (possibly in Cape Verde)

**DEADLINE FOR APPLICATION FOR THE HILTI FELLOWSHIP** (Summer term 2023), 31 October, [https://careers.hilti.li](https://careers.hilti.li), [https://www.uni.li](https://www.uni.li)

#### NOVEMBER 2022

**PROJMAN 2022 – INTERNATIONAL CONFERENCE ON PROJECT MANAGEMENT**, [https://projman.scika.org](https://projman.scika.org)

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For everything that concerns the ERCIS network simply write us an email. You will for sure get an answer from one of our team members. The team consists of Dr. Armin Stein, who is the managing director of the ERCIS network and is being supported by Dr. Katrin Bergener, who works part-time for the team and furthermore as Coordinator for the WWU Centre for Europe, and Julia Seither as team assistant.

Besides answering emails, the team helps organising events, maintains the website, organises the network communication, and supports project applications.

If you are interested in the network, get in touch with them!

info@ercis.org