

EXCELLENCE IN HUMAN-CENTERED LOGISTICS 4.0

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D3.1 – REPORT ON ORGANIZED SEMINAR

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1 Relevance for the project

The X-HuLog4.0 Seminar in Saarbrücken, hosted on September 29th and 30th by Saarland University's Center for Digital Transformation (CeDiT), brought together researchers and practitioners to exchange knowledge and discuss new developments in human-centered logistics. Organized as part of Work Package 3, "Advanced technologies for human-centered logistics," the seminar explored how emerging technologies can be designed and applied to improve working conditions, sustainability, and efficiency in logistics systems.

Over several sessions, participants discussed how the integration of advanced technologies can contribute to safer and more resilient logistics operations. Presentations covered a range of topics, including human-robot collaboration, ergonomic workplace design, digital assistance systems, and the role of data-driven decision-making in logistics environments. The seminar placed particular emphasis on translating research findings into practice, highlighting examples where technology supports workers rather than replacing them.

In addition to knowledge exchange, the seminar served as an important networking opportunity within the X-HuLog4.0 consortium. It enabled researchers from different partner institutions and countries to share their methodologies, align ongoing studies, and plan future collaborative activities. The discussions were marked by an open and constructive atmosphere, reflecting the project's overall goal of fostering a European community committed to advancing sustainable and human-centered logistics.

By combining scientific dialogue with practical insights, the Saarbrücken seminar made a valuable contribution to the project's objectives and laid the groundwork for further joint research and dissemination activities in the coming project phases.

2 Welcome Note from the Host

It was a great pleasure to welcome all participants to the X-HuLog4.0 Thematic Workshop and Seminars in Saarbrücken on September 29th and 30th 2025. We were delighted to host this gathering at Saarland University and to bring together researchers, practitioners, and stakeholders from across Europe to advance the conversation on human factors in Logistics 4.0.

The timing of this event was particularly special. Taking place just before German Reunification Day, celebrated this year in Saarbrücken, the workshop has been infused with the spirit of collaboration and shared purpose that this holiday represents. As the city prepared to welcome high-ranking officials and honored guests for the national celebrations, our participants dedicated themselves to another important task: shaping the future of human-centered logistics.

The X-HuLog4.0 project demonstrates that the challenges and opportunities of Logistics 4.0 cannot be addressed by technology alone. Success requires a strong focus on people: their needs, skills, safety, and capacity to thrive in increasingly digitalized work environments. This workshop was a space to exchange knowledge, test ideas, and develop approaches that bridge research and practice, technology and human experience.

We are deeply grateful to the European Union's Horizon Europe programme for supporting this project. EU funding has made it possible to bring together experts from nine countries, enabling cross-border collaboration that reflects the best of the European research spirit. By sharing our findings and insights, we strengthen the scientific foundation for human-centered logistics and contribute to more sustainable and inclusive supply chains across Europe.

On behalf of the organizing team, I thank all our speakers, panelists, and participants for their contributions and commitment. We hope this workshop will inspire new research and innovation foster partnerships that last well beyond these days in Saarbrücken.

Thank you for being part of this important endeavor.

Eric H. Grosse

Head of the Chair of Business Management and Digital Transformation in Operations Management

Host of the X-HuLog4.0 Thematic Workshop and Seminars at Saarland University

3 Agenda



AGENDA
Thematic Workshop and Seminars at Saarland University
September 29th-30th
Building A5.4 Room 2.05/2.06
66123 Campus Saarbrücken



Day	Start	End	Topic	Speaker	Objective
Day 1	08:30	09:00	Welcome Coffee		
Day 1	09:00	09:15	Welcome & Intro to Seminar Goals	Eric Grosse	Introduce seminar goals, context of Work Packages 3 and 7, and outline agenda
Day 1	09:15	10:00	Behavioral Insights and Optimization in Operations Management	Thomas De Lombaert	Analyze behavioral optimization strategies in operations
Day 1	10:00	10:45	Motion Capture System	Stephane Folley	Captiv System LIVE DEMO
Day 1	10:45	11:00	Coffee Break		
Day 1	11:00	11:45	Wearable Sensors for Monitoring Operator Fatigue and Stress	Minqi Zhang	Showcase motion tracking as a tool to optimize ergonomic logistics work environments
Day 1	11:45	12:30	Hands-On: Microsoft HoloLens for Applications in Logistics	Christian Murlowski	Use of a simple HoloLens 2 Application to experience possible scenarios
Day 1	12:30	13:30	Lunch Break		
Day 1	13:30	14:15	Human-Centered Research for Sustainable Warehousing	Sven Winkelhaus	Introduction into the field and it's importance
Day 1	14:15	15:00	Strategon's approach for tackling real world problems	Jan Sibold	Insights into the work of a consultancy
Day 1	15:00	15:15	Coffee Break		
Day 1	15:15	16:15	Workshop: Designing Research Projects in Real World Environments	Sven Winkelhaus & Michael Bauer	How to apply principles of human centricity to own research and how to avoid pitfalls
Day 1	16:15	16:45	Workshop II: Presentation of Research Projects & Best Idea Award	Sven Winkelhaus & Michael Bauer	Analyze behavioral optimization strategies in operations
Day 1	16:45	17:00	Summary & Group Photo	Eric Grosse	Wrap-up of Day 1 and team photo
Day 1	19:00		Self-Paid Dinner	Group Reservation	Networking dinner in Saarbrücken (for those who would like to join)
					Brauhaus zum Stiefel, Am Stiefel 2, 66111 Saarbrücken
Day 2	08:30	09:00	Welcome Coffee		
Day 2	09:00	10:00	Panel: Barriers & Enablers in Implementing Tech in Logistics Ops	Panelists: Eric Grosse, Steffen Ganders, Thomas De Lombaert, Thilini Ranasinghe	Summarize real-world implementation challenges and best practices. Moderator: Michael Bauer
Day 2	10:00	10:45	ChangeBots for supporting human aspects of transformational projects	Michael Bauer	ChangeBots as a tool for human-centric transformation support
Day 2	10:45	11:00	Coffee Break		
Day 2	11:00	11:45	German Bionic Exoskeleton	Steffen Ganders	Exoskeleton LIVE DEMO
Day 2	11:45	12:30	Editors' note: Responsible Use of AI in academic work	Eric Grosse & Christoph Glock	How AI can be used in scientific research and what to avoid
Day 2	12:30	13:30	Lunch Break		
Day 2	13:30	14:15	Human Robot Interaction and Ageing	Thilini Ranasinghe	Present challenges and solutions of ageing in human robot collaboration
Day 2	14:15	15:00	Enhancing Work Environments by Motion Tracking	Minqi Zhang	Discuss stress and fatigue monitoring with wearables in logistics settings
Day 2	15:00	15:30	Summary and farewell	Eric Grosse	Wrap-up and conclusion of Seminars and Thematic Workshop for WP 3 and WP7
Day 2	15:30	16:00	Coffee Takeaway		

Project Partners:



4 Hosts of Workshop and Seminar USAAR & TUDa

4.1 Eric H. Grosse – Saarland University

Eric H. Grosse is a Junior Professor and the Head of the Chair of Business Management and Digital Transformation in Operations Management at the Faculty of Human and Business Sciences at Saarland University, Germany. His research interests include sustainability in logistics and operations management with a focus on human-centric digital transformation. He is the editor-in-chief of Operations Management Research, an associate editor of the International Journal of Systems Science: Operations & Logistics and co-edited several special issues in international journals. He is co-director of the Center for Digital Transformation (CeDiT) at Saarland University and serves as a co-chair of IFAC TC 5.2 'Management and Control in Manufacturing and Logistics'. His work has appeared in various esteemed international journals, such as the International Journal of Production Research, OR Spectrum, the International Journal of Production Economics, the Journal of Business Logistics, the International Journal of Operations & Production Management, or the European Journal of Operational Research.

Eric H. Grosse and his team at Saarland University was the host of the Thematic Workshop and Seminars, as part of WP3 and WP7 of the X-HuLog4.0 Project. In this role, he introduced the networking partners, chaired the sessions, and oversaw the overall organization of the Saarbrücken event. In his opening address, he emphasized the importance of integrating human factors across the entire supply chain, not only to create more human-centered work environments but also to drive sustainable development and long-term economic success. He expressed gratitude to the European Union for supporting the project and enabling enhanced research opportunities for the participating VilniusTech researchers.

4.2 Christoph H. Glock – Technical University of Darmstadt

Christoph H. Glock is a Professor of Production and Supply Chain Management at Technical University of Darmstadt, Germany. His research interests include inventory management, supply chain management, warehousing, sustainable production, and human factors in logistics and inventory systems. His work has appeared in various international journals, such as IIE Transactions, Decision Sciences, OR Spectrum, the Journal of Business Logistics or the European Journal of Operational Research. He is area editor at Computers & Industrial Engineering, OR Spectrum and Applied Mathematical Modelling.

Christoph H. Glock and his team at Technical University of Darmstadt is the host of the Thematic Workshop and Seminars, as part of WP2 of the X-HuLog4.0 Project.

5 Dissemination and Public Visibility



Group Photo of Day 1 Participants

Image Credits: Thorsten Mohr, Saarland University Press Department

To increase the workshop's visibility and disseminate its outcomes, pictures were taken throughout the sessions, capturing both the dynamic discussions and the collaborative atmosphere of the event. For the official group photo, a university photographer supported the organizers on the first evening of the event. Afterwards Saarland's leading newspaper interviewed Host Eric H. Grosse about the project and the current research directions pursued by his team.

The workshop also benefited from strong online visibility, with continuous LinkedIn posts shared by both participants, the official X-HuLog4.0 Account and the Center for Digital Transformation (CeDiT) at Saarland University. These posts provided real-time impressions from keynote presentations, panel discussions, and breakout sessions, offering insights into the workshop's highlights and fostering engagement beyond the physical venue. By tagging project partners, acknowledging speakers, and sharing visual impressions, these posts amplified the reach of the event and helped build momentum for the project's objectives among a broader European research and practitioner community.

This multi-channel dissemination strategy, combining traditional media coverage, professional photography, and dynamic social media engagement, ensured that the achievements of the X-HuLog4.0 Thematic Workshop and Seminars resonated well beyond the immediate participants. It strengthened the project's presence within the European research landscape and promoted its commitment to advancing human-centered approaches in Logistics 4.0.

5.1 LinkedIn Posts:

5.1.1 Official:

X-HuLog4.0 Official Workshop Announcement: https://www.linkedin.com/posts/eu-project-x-hulog4-0_xhulog40-activity-7371278527104434177-

kNfR?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

X-HuLog4.0 Official Repost: [https://www.linkedin.com/posts/eu-project-x-hulog4-0_captiv-mewa-strategion-activity-7380988136593534976-](https://www.linkedin.com/posts/eu-project-x-hulog4-0_captiv-mewa-strategion-activity-7380988136593534976-yWnl?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

yWnl?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

X-HuLog4.0 Mentioning in September Newsletter: [https://www.linkedin.com/posts/eu-project-x-hulog4-0_x-hulog40-newsletter-for-industry-2-activity-7383063903767023616-](https://www.linkedin.com/posts/eu-project-x-hulog4-0_x-hulog40-newsletter-for-industry-2-activity-7383063903767023616-4RcQ?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

4RcQ?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

CeDiT USAAR Preview: [https://www.linkedin.com/posts/center-for-digital-transformation_human-logistics-warehousing-activity-7374432505107595264-](https://www.linkedin.com/posts/center-for-digital-transformation_human-logistics-warehousing-activity-7374432505107595264-xZCR?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

xZCR?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

CeDiT USAAR Day 1: [https://www.linkedin.com/posts/center-for-digital-transformation_captiv-xhulog40-industry5-activity-7378753568117530624-](https://www.linkedin.com/posts/center-for-digital-transformation_captiv-xhulog40-industry5-activity-7378753568117530624-FGcN?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

FGcN?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

CeDiT USAAR Day 2: [https://www.linkedin.com/posts/center-for-digital-transformation_exchange-collaboration-perspectives-activity-7379445841553489920-](https://www.linkedin.com/posts/center-for-digital-transformation_exchange-collaboration-perspectives-activity-7379445841553489920-qrQK?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

qrQK?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

PSCM TU Darmstadt: [https://www.linkedin.com/posts/xhulog40-logistics-supplychainmanagement-ugcPost-7381565249403060225-](https://www.linkedin.com/posts/xhulog40-logistics-supplychainmanagement-ugcPost-7381565249403060225-7bJM?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

7bJM?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

5.1.2 Participants posts:

Thilini Ranasinghe: [https://www.linkedin.com/posts/thilini-ranasinghe_captiv-mewa-strategion-ugcPost-7379252677861457921-](https://www.linkedin.com/posts/thilini-ranasinghe_captiv-mewa-strategion-ugcPost-7379252677861457921-goRx?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

goRx?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

Amir Zare: [https://www.linkedin.com/posts/amirzare90_phdlife-researchjourney-xhulog-ugcPost-7381383418963623936-](https://www.linkedin.com/posts/amirzare90_phdlife-researchjourney-xhulog-ugcPost-7381383418963623936-ZFaZ/?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

ZFaZ/?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

Steffen Ganders: [https://www.linkedin.com/posts/activity-7381708206781255680-](https://www.linkedin.com/posts/activity-7381708206781255680-_Olc/?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

_Olc/?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

Michael C. Bauer: [https://www.linkedin.com/posts/michael--bauer_ai-exoskeleton-exia-activity-7383076787351781376-](https://www.linkedin.com/posts/michael--bauer_ai-exoskeleton-exia-activity-7383076787351781376-QcDN/?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ)

QcDN/?utm_source=share&utm_medium=member_desktop&rcm=ACoAAANf9xEBuCGQEDj8eo1hAKjYbYKQOPmLYWQ

6 Speakers and Topics



Thomas de Lombaert – Hasselt University

Thomas de Lombaert recently completed his PhD at Hasselt University (Belgium), where he conducted research on the integration of human factors in warehouse operations. In his doctoral research, he developed and tested a system that involves workers in operational decision-making, rather than relying on the traditional top-down task assignment practice, commonly observed in modern-day warehouses. His system has been tested both in a real-world warehouse and a lab environment.

6.1 Behavioral Insights and Optimization in Operations Management

In his presentation, he discussed the development and implementation process of the employee-involved working system and outline future directions for this research. The results all point into the same direction: improved job satisfaction without harming productivity, not only in the short, but also the long run. Starting October 1, 2025, he will continue this line of research as a postdoctoral researcher, focusing on the preconditions for humane working conditions in warehouses.



Stéphane Folley – TEA Tech Ergo

X-HuLog4.0 has chosen TEA Tech Ergo as practice partner and one of the technology providers for the project because their emphasis on ensuring better ergonomics for workplaces has been part of their mission for more than two decades. The advantage of the CAPTIV assessment tool is its precision in measuring stress on joints for workers which can hardly be achieved by manual observation only. This

accuracy in combination with a variety of visual support systems enables researchers to see which movements are problematic and when they arise during the work.

The CAPTIV assessment tool is available for X-HuLog4.0 researchers as part of the CeDiT Lab at Saarland University.

Stéphane Folley is the head of sales at TEA Tech Ergo based in Nancy, France.

6.2 Motion Capture System – Captiv Live Demo

For 25 years, TEA has been developing and enhancing the CAPTIV assessment tool, which is widely used worldwide, in both academia and industry, for ergonomics and HMI studies and assessment.

The CAPTIV software provides powerful macro and micro analysis from the flexible combination of a variety of proprietary sensors for motion capture, muscle load, heart rate, and more.

In his presentation Stéphane showcased several CAPTIV case studies focused on warehousing and logistics, highlighting applications in both real-world environments and virtual reality (VR) settings.

Minqi Zhang – Saarland University

Minqi Zhang is a PhD candidate at Saarland University. His research focuses on simulation and operations research modelling and optimization methods for human-robot collaboration in logistics systems, with particular emphasis on task allocation, scheduling, and human-centric decision-support modelling.

6.3 Wearable Sensors for Monitoring Operator Fatigue and Stress (Day 1)



6.4 Enhancing Work Environments by Motion Tracking (Day 2)

His two-part presentation explored how wearable sensor data and motion capture technologies can support human-centric decision-making in industrial environments. Using a case study from the order picking process, it illustrates how human factors like fatigue and stress can be evaluated (Part 1, Day 1) and integrated into OR-based planning models to improve both system efficiency and worker well-being (Part 2, Day 2). The two-part presentation approach enabled PhD researchers to see development and progression of long term research projects.



Christian Murlowski – Saarland University

Christian Murlowski is a Research Associate and PhD Candidate working in the field of immersive technologies, especially augmented reality (AR). His research focuses on how such emergent technologies influence human perception, communication, and interaction within digitally augmented spaces.



6.5 Hands-On: Microsoft HoloLens for Applications in Logistics

In his presentation, he gave a brief overview about his current research, the potential of AR in the logistics sector, demonstrating how immersive technologies can support processes and enhance efficiency. As part

of the session, participants were invited to try out a prototype application with the Microsoft HoloLens 2, offering hands-on experience with possible real-world use cases.



Participant Using the Microsoft HoloLens

Dr. Sven Winkelhaus – MEWA Textilservice

Dr. Sven Winkelhaus is currently working as “Leader of projects and processes” in the department of production and logistics at Mewa Textilservice SE & Co. Management OHG in Wiesbaden. Within the X-HuLog 4.0 Project he is providing insights based on my field of research as an external researcher associated with TU Darmstadt and Universität des Saarlandes also giving insights in real world environments from his industry experience.



6.6 Human-Centered Research for Sustainable Warehousing

His presentation deals with the development towards Logistics 4.0 and the evolving changes of human work that come along with this. Starting from the importance of human work and warehouses in general, the presentation shows research results how human work changes through digital transformation. By enabling handling complexity efficiently, digital technologies enable more flexible automation and reducing manual workload of humans.

Based on this he derived a framework to address these changes practically and how to provide a more realistic return on investment calculation. By providing real world examples, these topics' importance was emphasized.

Jan Sibold – Strategion

With 20 years of experience across industry, consulting, and professional networks, Jan Sibold acts as a sparring partner, advisor, and facilitator between executive leadership, business units, IT, and AI teams. He focuses on creating clearly defined value for clients through collaborative, people-centered, and holistic approaches. A strategist, networker, and communicator, he has a proven track record in leading complex change, restructuring, and growth initiatives, combining a digital and lean mindset with a strong drive for innovation.



6.7 *Strategion's Approach for Tackling Real-World Problems*

In his presentation Jan Sibold explored how AI-driven optimization projects can transform operations in automotive and manufacturing logistics and how the Lean-methodology is still highly relevant in digital transformation. He highlighted the often-overlooked human factors that determine the success of AI initiatives, ranging from workforce acceptance and change readiness to collaboration between operational teams and AI systems. Drawing on practical examples, Sibold discussed the challenges of integrating advanced technologies into complex industrial environments and emphasized that sustainable value creation depends on aligning technical solutions with human-centered processes. He concluded with an outlook on how future AI systems will further empower employees, enhance decision-making, and improve resilience in increasingly digitalized logistics networks.

Michael C. Bauer – Saarland University

A research associate and PhD Candidate at the Center for Digital Transformation at Universität des Saarlandes, Michael C. Bauer is also leading his own coaching and consulting practice. Prior to his return to academia, he was a division manager at a world-leading industrial engineering company, where he was responsible for developing enabling infrastructures and business models for future markets. His research focuses on the role of coaching in digital transformation, exploring how 1:1, group, and AI-supported coaching approaches can enhance the success of transformation initiatives, particularly in manufacturing and logistics.



6.8 ChangeBots for supporting human aspects of transformational projects

In his presentation Michael Bauer illustrated the use of AI coaching for digital transformation. He emphasized the critical need to positively influence transformation processes due to their high failure rates and significant economic implications. He highlighted how AI-supported coaching can guide organizations through complex change by fostering engagement, resilience, and effective leadership. In the second part of his talk, Bauer outlined the technical and organizational setup of such systems and showcased a prototype designed to support employees and leaders during transformation initiatives, demonstrating its potential to bridge the gap between technology and human adoption.

Steffen Ganders, German Bionic

As Head of Public Affairs at German Bionic, his mission is to promote groundbreaking wearable robotic technologies to key external stakeholders, championing smart exoskeletons that redefine what's possible in the modern workplace. By leading collaborations at the intersection of industry, policy, science and society, it's possible to shape environments where human-centric innovation—like German Bionic's AI-powered exoskeletons—sets new standards of safety, productivity, and inclusivity. In times when organizations everywhere embrace human augmentation, demonstrating how smart exoskeletons are transforming tomorrow's modern working world explaining innovations is crucial.



6.9 Human Augmentation: Smart Exoskeletons for tomorrow's modern working world

In his presentation Steffen Ganders offered a compelling and practice-oriented exploration of how wearable robotic technologies are transforming the workplace. He highlighted the company's mission to advance human-centric innovation by developing AI-powered exoskeletons that enhance worker safety, reduce physical strain, and improve productivity in physically demanding industries such as logistics and manufacturing.

Ganders emphasized that human augmentation is no longer a futuristic concept but an emerging reality in modern work environments. By showcasing real-world examples, he illustrated how smart exoskeletons can significantly lower the risk of musculoskeletal injuries, extend the healthy working life of employees, and support workforce inclusivity by enabling a broader range of individuals to perform physically intensive tasks.

As a highlight participants had the opportunity to try the exoskeleton and use it to lift and lower heavy items, simulated by water crates.



Top: Participants trying the Exoskeleton by German Bionic; Below: Michael C. Bauer, Eric H. Grosse and Steffen Ganders (German Bionic)

Thilini Ranasinghe

A PhD candidate at the Chair of Digital Transformation in Operations Management, Faculty of Human and Business Sciences, Saarland University, Germany. She has a background in Industrial Engineering and has been recipient of the GraduSAAR (Saarland Graduate Funding Programme) since 2022. Her research focuses on human-centric digital transformation within manufacturing and logistics industries.



6.10 Human Robot Interaction and Ageing

This research focus on investigating how to create socially sustainable human robot systems at workplace and how they can support aging workforce. The presentation showed the findings from a lab experiment comparing the impact of AMR assisted order picking on different aged individuals. Results from a preliminary content analysis on literature for social sustainability indicators in human robot systems were also presented.

7 Special Formats

7.1 WORKSHOP: Designing Research Projects for Real-World Environments

Together with [Dr. Sven Winkelhaus](#), [Michael C. Bauer](#) hosted and moderated the two-part workshop “*Designing Research Projects in Real-World Environments*” engaged participants in hands-on activities to bridge the gap between academic research and practical application. In the first session, researchers worked collaboratively on defining research problem statements, developing stakeholder maps, and crafting co-creation strategies to ensure relevance and impact in real-world contexts. The second session, “*Presentation of Research Projects & Best Idea Award*,” provided a platform for participants to present their project concepts, share insights, and receive feedback from peers. The workshop concluded with the presentation of the Best Idea Award, recognizing the most innovative and well-presented research project. Based on an anonymous vote by all participants the Award for best presentation went to the team of: Thomas de Lombaert, Valentas Gružas, Minqi Zhang and Eric H. Grosse. As a prize each group member received a Saarland University Coffee Cup



7.2 PRACTICAL GUIDANCE: Public Funding Application

As part of his presentation, Michael provided practical guidance on navigating funding opportunities for innovation and transformation projects. He outlined key considerations when selecting suitable funding programs, such as alignment with project objectives, eligibility criteria, and the importance of demonstrating measurable impact. Bauer shared insights on common pitfalls in funding applications and offered step-by-step recommendations on how to structure proposals effectively, build strong consortia, and communicate project value to funding bodies. His tips aimed to help organizations accelerate their transformation efforts by leveraging available public and private funding resources.

7.3 PANEL DISCUSSION: Barriers & Enablers in Implementing Tech in Logistics Ops

The panel brought together scholars and practitioners to discuss the future of human-centered logistics. [Eric H. Grosse](#) (Human-Centered Logistics 4.0), [Thilini Ranasinghe](#) (Human-Robot Collaboration and Aging), [Thomas de Lombaert](#) (Worker Preferences in Warehouses), and [Steffen Ganders](#) (German Bionic) shared complementary insights, combining academic perspectives with industry experience.

The session opened with reflections on the current state of technology adoption in logistics. While all panelists agreed that Logistics 4.0 has moved beyond the buzzword stage, they highlighted persistent misconceptions, particularly the belief that digital transformation is primarily a technological challenge. Instead, the panel emphasized the critical importance of human engagement, change readiness, and alignment between technology and workplace practices.

In addressing barriers to implementation, the discussion focused on strategies for integrating new solutions with legacy systems, the need for structured and purposeful data collection, and overcoming resistance to change. Practical approaches included early stakeholder involvement, transparent communication, and incremental rollout strategies to avoid disruptions.

The deep-dive segment explored enablers and success factors for people-centered logistics. Panelists stressed that a robust change management program, clear communication of benefits, and participatory training approaches are essential for building trust in new technologies and empowering employees. They discussed the evolving skill requirements of the logistics workforce, emphasizing problem-solving, adaptability, and digital literacy, and shared insights into designing effective upskilling and reskilling

programs. Special attention was given to human-robot collaboration, where ergonomics, safety, and workforce acceptance were seen as key considerations.

Looking ahead, the panelists identified pressing research needs in understanding human factors in Logistics 4.0, including trust in AI-driven decision-making, the long-term effects of human-robot collaboration, and strategies for engaging an aging workforce. The discussion concluded with predictions on future disruptors, ranging from advanced robotics to AI-powered decision support, and their implications for shaping more resilient, adaptive, and human-centered logistics systems.

This lively exchange demonstrated the value of cross-disciplinary collaboration and highlighted that the future of Logistics 4.0 will depend as much on integrating human factors as on technological innovation.

7.4 EDITOR'S NOTE: Responsible Use of AI in Academic Work

The special session on “Editors Note: Responsible Use of AI in Academic Work,” led by [Christoph H. Glock](#) and [Eric H. Grosse](#), was very well received and generated active engagement from the audience. The session addressed one of the most timely and pressing topics in academia today: the appropriate and transparent use of AI tools in research and publishing. Both are experienced Editors with numbers of papers reviewed going into the thousands.

Eric Grosse opened the session by sharing real-world examples of poor AI use in journal submissions, including cases where unverified or fabricated content had been introduced. He emphasized that AI can never be considered an author in academic work and highlighted the importance of accountability and integrity in scientific writing. Both editors pointed out that AI can be highly beneficial for improving language, clarity, and text flow, but that each journal has its own specific AI-related guidelines. He advised authors to study these guidelines carefully before submitting AI-augmented manuscripts to ensure compliance and maintain scholarly standards.

Christoph Glock complemented this perspective by presenting a positive example from his own research, demonstrating how AI tools can serve as valuable enhancement instruments when used purposefully and with transparent disclosure. His example showed that, when responsibly integrated, AI can streamline certain aspects of research and writing without compromising scientific rigor.

The lively discussion that followed reflected the audience's keen interest in balancing the opportunities and risks of AI in academic work. The session underscored the need for clear ethical standards, transparent reporting practices, and continued dialogue between researchers, editors, and institutions to ensure responsible and constructive use of AI in the academic community.



Editors Note on AI Session: Christoph H. Glock and Eric h. Grosse

8 Impressions

The two days went by quickly and a lot of the communication that happened between sessions cannot be captured within this report. One thing that was repeated by several participants was the value of connecting in such a setting. We have also been given feedback from different participants (academia and industry) who met at the event and are now planning for future collaboration.

Quotes from Participants:

This project (X-HuLog4.0) makes people the driving force, leveraging technology exactly where it supports healthier, safer, and more fulfilling work. It empowers—rather than replaces—employees, seeing humans not as mere supplements, but as active, creative shapers of progress. – Steffen Ganders

Some tools were new to me, some talks made me think deeply, and some conversations truly opened my eyes. For an early-stage researcher like me working in the human-centric world, it was the perfect blend of challenge and inspiration. -Amir Zare

Wearing the incredible Exia exoskeleton from German Bionic as part of our EU Project X-HuLog4.0 workshop at Universität des Saarlandes was a glimpse into the future that is already available for companies that think forward. – Michael C. Bauer

Thank you all for generously sharing your experience and expertise with us. – Thilini Ranasinghe



9 List of Participants

Registered Participants for X-HuLog4.0 Thematic Workshops and Seminars Saarbrücken .

Last Name	First Name	Participant University / Employer
Burinskiene	Aurelija	VILNIUS TECH
Gružasuskas	Valentas	VILNIUS TECH
Lingaitiene	Olga	VILNIUS TECH
Daškevič	Diana	VILNIUS TECH
Serackis	Arturas	VILNIUS TECH
Leonavičienė	Edita	VILNIUS TECH
Serackiene	Greta	VILNIUS TECH
Burinskas	Arunas	VILNIUS TECH
Daskevic	Faustina	VILNIUS TECH
Burinskiene	Aurelija	VILNIUS TECH
Glock	Christoph	TU Darmstadt
Panja	Subrata	TU Darmstadt
Zare	Amir	NTNU Trondheim
Grosse	Eric	Universität des Saarlandes
Zhang	Minqi	Universität des Saarlandes
Ranasinghe	Thilini	Universität des Saarlandes
Bauer	Michael	Universität des Saarlandes
Murlowski	Christian	Universität des Saarlandes
Wita	Saskia	Universität des Saarlandes
De Lombaert	Thomas	Universiteit Hasselt
Folley	Stephane	TEA - Tech Ergo Appliquées
Winkelhaus	Sven	MEWA Textile Services
Sibold	Jan	Strategion
Ganders	Steffen	German Bionics

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Special thanks go to our project partners and participating companies, whose expertise and active involvement in discussions and demonstrations enriched the workshop and strengthened the link between academic research and real-world practice.

We would also like to acknowledge the valuable contributions of all participants – researchers, early-stage researchers (ESRs), practitioners, and students – for their presentations, insights, and engagement throughout the sessions. Their dedication and collaborative spirit turned the workshop into a truly interactive and inspiring event.

Our gratitude extends to Saarland University and the Center for Digital Transformation (CeDiT) for hosting the event and providing excellent facilities and support. The commitment of the local team in Saarbrücken was essential for ensuring a smooth organization and a welcoming environment for our international guests.

Finally, we appreciate the efforts of everyone who contributed behind the scenes: from technical and administrative staff to communication teams, for their role in enabling the successful dissemination of the workshop's outcomes.

Together, this joint effort reflects the European spirit of collaboration and underlines the importance of connecting science, industry, and society in advancing the goals of human-centered Logistics 4.0.



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