



INTERNATIONAL
SUMMER
SCHOOL

INTERNATIONAL SUMMER SCHOOL 2023

#08





Smart Systems and Supply in the Spotlight

The world is getting more and more interconnected and complex. In this process society faces numerous challenges, especially in the context of finite resources and climate change: Can digitized logistics and supply systems create a distribution of goods that is both sustainable and economical? Does building automation contribute to an ecological and socially acceptable transition? These are just some of the questions we addressed at this year's International Summer School in the light of the digital transformation of systems and supply.

Titled "Regional Sustainability: Smart Systems and Supply", the International Summer School 2023 offered an exciting program covering a groundbreaking topic in an international setting. The participants had the occasion to explore developments and chances of supply systems for the future and discussed the opportunities as well as the critical aspects interdisciplinary with experts and participants from all over the world.

Dortmund University of Applied Sciences and Arts (FH Dortmund), Bochum University of Applied Sciences (HS Bochum) and Westphalian University of Applied Sciences (WH) cooperate in the strategic alliance of Higher Education Alliance Ruhr (Hochschulallianz Ruhr - HAR) and in various projects, such as Ruhr Master School (RMS). The International Summer School is jointly organized by Ruhr Master School, Higher Education Alliance Ruhr and InduTwin, a project for strategic partnership with universities in China and Latin America. Its goal is to bring students and lecturers from different countries and continents as well as from different professional backgrounds together and discuss these pressing questions about sustainability in logistics and supply.

This year we welcomed 48 students from Israel, Turkey, Kosovo, Spain, Albania, Argentina, Colombia, Chile, Austria, Lithuania, Peru, Mexico, Romania, China, Kenya, India, Afghanistan, and Germany.

SCHEDULE

DAY	ACCOMPANYING PROGRAM
Monday, 21/08/2023	<ul style="list-style-type: none"> Welcome & Get-Together with international students Buddy Time Social Event
Tuesday, 22/08/2023	<ul style="list-style-type: none"> German Basic Knowledge with Bettina Weiper Guided Tour: Zeche Zollverein
Wednesday, 23/08/2023	<ul style="list-style-type: none"> German Basic Knowledge with Bettina Weiper Buddy Time: Tour to Münster
Thursday, 24/08/2023	<ul style="list-style-type: none"> Guided Tour: Phoenix des Lumières Guided Tour: Signal Iduna Park (stadium of BVB 09)
DAY	PROFESSIONAL PROGRAM
Friday, 25/08/2023	<ul style="list-style-type: none"> Registration Greeting: Presentation of program and Kick-off Group work Cross-Cultural Connection Workshop
Monday, 28/08/2023	<ul style="list-style-type: none"> Workshops: Deep Learning for Computer Vision, Modern Design Theory and Method, Sustainability Report/ Integrated Report, Sustainability - Smart Systems and Supply, Mind Your Privacy - Computer Vision in Smart City Keynote: Prof. Dr. Ingo Kunold (IKT, FH Dortmund): How does Electricity Get into Quarters? Challenges and Solutions of Decentralized Energy Supply
Tuesday, 29/08/2023	<ul style="list-style-type: none"> Workshops: Deep Learning for Computer Vision, Modern Design Theory and Method, Sustainability Report/ Integrated Report, Sustainability - Smart Systems and Supply, Mind Your Privacy - Computer Vision in Smart City Keynote: Prof. Dr. Anne Meinke (FH Do) „Supply Chain Due Dilligence Act and Sustainability - Just extra work or common goals?“ Keynote: Prof. Dr. Jan Cirullies (FH Do) „Resource Efficiency in Supply Chains Through Digital Collaboration“
Wednesday, 30/08/2023	<ul style="list-style-type: none"> Workshops: Nudging for Sustainable Decisions, Smart Agriculture: Emerging Technologies and challenges, Manufacturing from a Sustainability Point of View, Image Digitization and Pattern Recognition, My Energy Consumption – Sustainability in the context of ICTs and Industry 4.0 Excursion: Hafen Duisburg (duisport)
Thursday, 31/08/2023	<ul style="list-style-type: none"> Workshops: Nudging for Sustainable Decisions, Smart Agriculture: Emerging Technologies and challenges, Manufacturing from a Sustainability Point of View, Image Digitization and Pattern Recognition, My Energy Consumption – Sustainability in the context of ICTs and Industry 4.0 Panel discussion: Future Visions of Smart Supply Systems: Challenges of the Digital Transformation in the Logistic and Supply Sector
Friday, 01/09/2023	<ul style="list-style-type: none"> Exams Gallery Walk & Best Poster Award Farewell



MONDAY, 21/08/2023

Get together

All international participants were warmly welcomed by Prof. Dr. Stephan Weyers (Vice Rector Teaching and Studies, FH Dortmund) and Prof. Dr. Timm Braasch (RMS Director of WH) at the campus of Dortmund University of Applied Sciences and Arts. The team gave an introduction to the event and provided helpful information for the guests as well as an overview on the accompanying program of the first four days.

At the following get-together, the students met their German buddies: local students who got involved in accompanying and supporting their international peers. The buddies had prepared a session in which each participant brought an exciting item from his or her homeland to talk about and get to know the variety of cultures. On the sunny place in front of the Kostbar food and drinks were served in a social event - the right atmosphere to get into talks with each other.



Welcome session at Fachhochschule Dortmund



Get-together with the buddies

TUESDAY, 22/08/2023 TO THURSDAY, 24/08/2023

Exploring Ruhr Metropolis

Traveling, studying, living in another country often goes along with a foreign language; knowing a few words can be the beginning of friendship! Our German instructor Bettina Weiper introduced our participants into some basic words and sentences for everyday life and practiced them in small dialogues.

The Ruhr Metropolis is a very special area: Known for its former heavy industries like coal and steel, it went through a structural transformation and is now a vivid region with high tech companies, a growing knowledge sector, various start-ups and furthermore a prominent cultural scene. During these three days, our international students got to know the Ruhr Metropolis better:

- Visiting "Zeche Zollverein", a UNESCO world heritage site, led directly into the heart of the region's cultural identity.
- Staying in Metropolis Ruhr is not complete until you visit a football stadium! Therefore, the group was on the trail of internationally well-known Borussia Dortmund.
- At "Phoenix des Lumières", the participants could dive into art: With video projection, the paintings of Gustav Klimt and Friedensreich Hundertwasser were brought to life.
- One afternoon was organized by the local buddies: That tour led the whole group to Münster in the heart of Westphalia.



In the locker room of Signal Iduna Park, the stadium of BVB 09 Dortmund

Lecturers' program

During the first days of the Summer School, the international lecturers participated in an InduTwin workshop and Symposium: International Collaboration between Universities and Companies. In addition, they were able to get to know the university of applied sciences and some departments during laboratory tours and meetings with deans.



Guided tour at Phoenix des Lumières



Guided tour at Phoenix des Lumières



Buddy time in Münster



Guided tour at Signal Iduna Park



„In jail“ at Signal Iduna Park



FRIDAY, 25/08/2023

International Summer School means many languages, many cultures.

On Friday, the group of students grew when the local participants joined as well. To kick off the professional program, Dr. Ramona Schröpf (Vice-Rector Communication and Internationalization at FH Dortmund), welcomed all faculty and students and wished them a successful and enriching week. Daniela Rings from HAR and Prof. Dr. Timm Braasch from RMS also joined these greetings. The colleagues of the international offices of the University of Applied Sciences Bochum and the Westphalian University brought some facts about the different cooperations and a quiz about the universities and the region.

Internationality and interdisciplinarity are two core ideas of our Summer School: people from different countries and different disciplines work together on a future topic. That goes without a hitch? Perhaps it is quite good to practice this interaction after all: In three groups, the experts from Working Between Cultures, Darijo Visevic, Helen Schliep and Michelle Eberhard, discussed with the students the winning as well as challenges of working and learning in mixed teams. Understanding how much one is entrenched in one's own culture and admitting this to the other is an important first step in working well together and benefiting from the different approaches and experiences. In this way, mutual understanding and trust can be built.

The opportunity to apply the knowledge just acquired was given to the participants who registered for the Summer School through RMS and HAR: They were divided into small teams by the organizer and given the same task. As we were in the Ruhr area, each of the five groups was given the name of a Ruhr area city

Group Task:

Your smart supply system for a sustainable future in urban areas!

Which concepts of smart systems and supply are the most promising for a sustainable development in urban areas? Imagine ideas and select one element of smart systems and supply. Sketch a concept for a metropolitan region and present it on a poster. What are the economic, technical, ecological, or social impacts of your concept? What opportunities and challenges do you see?

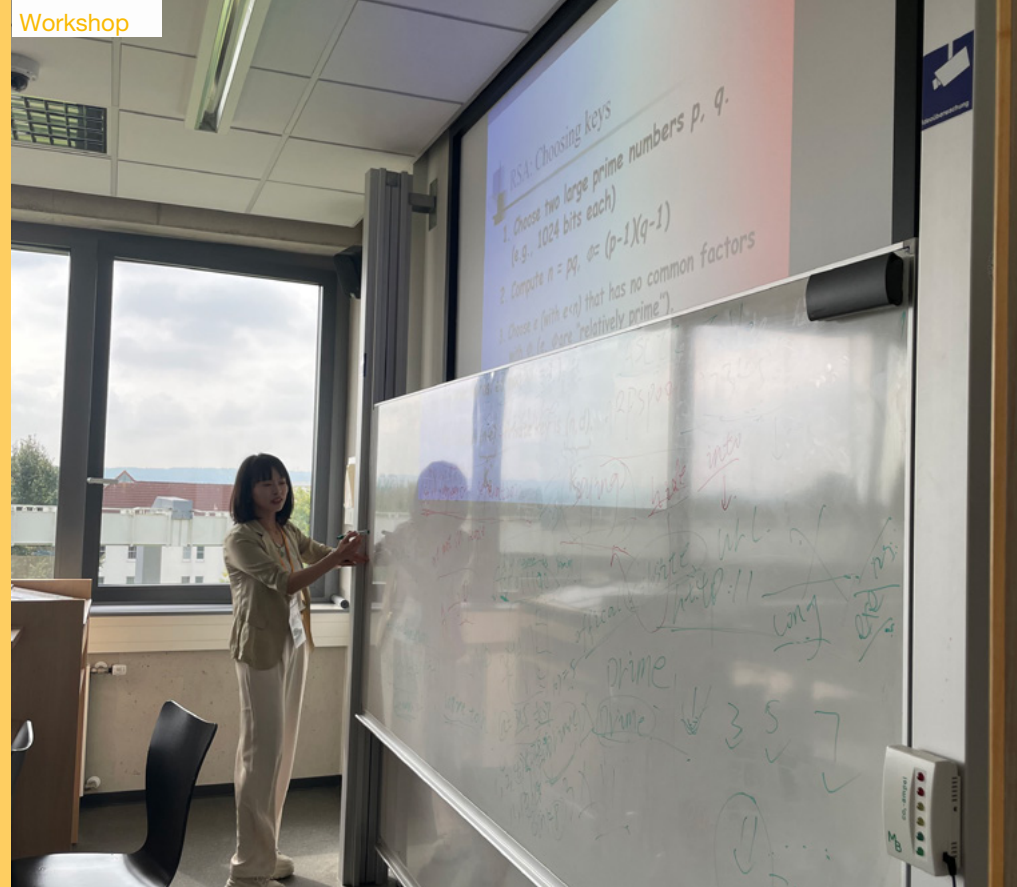
The results were to be presented one week later on the finale day to the plenum and a jury.

MONDAY, 28/08/2023 TO TUESDAY, 29/08/2023

Available workshop streams on Mo/Tue:

During the following four days, our international teachers were fully engaged. They offered different workshops, each of which covered two mornings.

Deep Learning for Computer Vision Marks Calderon, Universidad ESAN, Peru	teaching a practical approach of Deep Computer Vision to process satellite images; analytical skills for understanding concepts, theories and tools of Artificial Intelligence to support disaster management analyzing satellite imagery
Modern Design Theory and Method Wang Haoqi, Zhengzhou Univ. of Light Industry, China	understanding the design of complex mechanical products; cooperation of multiple engineering disciplines under multi-objectives and multi-constraints considering sustainability
Sustainability Report/Integrated Report Rodrigo Latorre, Universidad de Valparaiso, Chile	discussion of strategic management of an organization, responding to the demand for non-financial information and diversity; description of a company's business model taking into consideration environmental, social, personnel, respect for human rights, anti-corruption and bribery issues
Sustainability - Smart Systems and Supply Carlos Arredondo, Universidad de Medellin, Colombia	introduction to concept of sustainability and how smart systems and renewables can be used to achieve sustainability goals; learning about energy transition and renewable energy, smart cities and smart grids, and some basic concepts regarding emerging technologies such as energy efficiency, renewable energy integration, Internet of Things, and blockchain
Mind Your Privacy - Computer Vision in Smart City LI Pengfei/YANG Jia, Hubei University of Technology, China	knowing the importance of digital infrastructure requirements in a smart city; discussion of balancing the benefits of data collection and analysis with the need to protect individual privacy



MONDAY, 28/08/2023 TO TUESDAY, 29/08/2023

Special Insights - Keynote

For further information on the topic of Smart Systems and Supply and some special insights, keynote speakers were invited, each providing insight from their own professional perspective.

Prof. Dr. Ingo Kunold from the Institute of Communication Technology (FH Dortmund) gave a technical insight into the topic “How does Electricity Get into Quarters? Challenges and Solutions of Decentralized Energy Supply”. The conventional structure for energy production and consumption is based on fossil fuels generated by a few large power plants. In the world of today and tomorrow, energy production will be organized in a much more decentralized way, will be based much more on renewable energies such as solar or wind energy. Through small, private power plants such as PV systems, the former consumers also become producers. How must the energy distribution network be equipped to cope with this situation and ensure security of supply? How can consumers use this system as profitably as possible? These questions were explored in this session.

The next keynote by Prof. Dr. Anne Meinke from the Faculty of Business Studies (FH Dortmund) referred to a juridical question: “German Supply Chain Act and Sustainability – Extra Work or Common Goals?” was her topic. This law requires larger companies to demonstrate sustainability for entire production chains. How this can be implemented, what advantages this brings for sustainability and how companies can also ultimately benefit from it were explained and discussed.

The third keynote focused on how digitalization can support sustainability and fair competition within supply chains. Prof. Dr. Jan Cirullies, also from the Faculty of Business Studies (FH Dortmund), shed light on the topic “Resource Efficiency in Supply Chains Through Digital Collaboration - Insights from the-Catena-X Project”. Data on a complete supply chain, from the individual raw materials to the finished product, has not been brought together centrally until now. Catena-X is set to change that: How are all the components of a production process connected? If this question can be answered, the use of resources can be better planned, for example.

WEDNESDAY, 30/08/2023 TO THURSDAY, 31/08/2023

Available workshop streams on Wed/Thur:

Nudging for Sustainable Decisions Yamila Martin Ferlaino, Univ. de Buenos Aires, Argentina	definition and description of nudges; impact of judgements, biases, and nudges on sustainable and smart systems
Smart Agriculture: Emerging Technologies and challenges Javier Garcia Fronti, Univ. de Buenos Aires, Argentina	emerging technologies for the Internet of Things-based smart agriculture and Big Data platforms; discussion of sustainable agriculture challenges and responses on the ground together with national and international responses
Manufacturing from Sustainability point of view Prof. Subramanya, R.V. College Bangalore, India	introduction of manufacturing systems and their use in diverse industrial applications; evolution to smart manufacturing systems in consideration of sustainable and economic impacts
Image Digitization and Pattern Recognition Huang Min, Zhengzhou Univ. of Light Industry, China	teaching and discussion of basic concepts of image digitization, basic image operations, image compression coding, image feature extraction, and image recognition
My Energy Consumption – Sustainability in the context of ICTs and Industry 4.0 Jesús Barrón, Univ. Tecnológica de Tecámac, Mexico	understanding concepts related to sustainability and its relationship with ICTs; analysis of the importance of current technologies in the development of Industry 4.0



WEDNESDAY, 30/08/2023

Excursion to Duisport – Duisburg harbor logistics/duisport packing logistics and logport 1

Our excursion led us to Europe's biggest inner harbor. Its size is enormous, but the group could have a small glimpse on certain parts. Jan-Christoph Maaß Senior Project Manager – Research and Innovation, joined us on the bus tour and gave basic information as well as answers to very specific questions from the participants. Duisburg harbor has an over 300-year history and is nowadays an important hub for commodities between the big sea harbors like Rotterdam or Antwerp and places all over the continent – not to forget China and the new Silk Road. Not only vessels play an important role in transportation and logistics, but also the railway and trucks. All three transportation systems are linked at this place. Around 50.000 people are working for companies in the harbor itself as for direct suppliers and services. That is why Duisport and the other companies on that ground are so important for Duisburg's structural change from coal and steel to modern logistics.

Coming to the topic of sustainability, it is to say that the local companies are not raised on the green ground, but on former industrial areas like coal docks or steel plants. To produce energy for its own usage, Duisport invests in

research on hydrogen – several projects are currently running.

An experience beside water, logistics and containers was the bus trip via the highway A40 – traffic jam as its best ...



Excursion to Duisport

THURSDAY, 31/08/2023

Challenges of supply systems of the future - Panel-discussion:

To consolidate the results of the Summer School, the question „Future visions of smart supply systems: challenges of the digital transformation in logistic and supply sector“ was the focus of a lively panel discussion with moderator Daniel Ullrich. Prof. Dr. Andreas Becker (University of Applied Sciences Dortmund), Felix Musolf (duisport AG), Eva Conraud Koellner (Universidad de Guanajuato) and Maria Guadalupe Arredondo Hidalgo (Universidad de Guanajuato) discussed the opportunities and risks of digital transformation in logistics. Social participation and data privacy were the hot topics among panelists and the plenary.



Workshop



Group work sessions



Panel discussion

Poster presentation: Team Gelsenkirchen



Team Dortmund



Team Bochum



Team Essen



Team Herne



FRIDAY, 01/09/2023

18 nations, 5 teams, 1 assignment.

Time has flown by - Already the last day of the international Summer School and the great finale was there. Today the students from the InduTwin project wrote exams in their respective workshops. The RMS and HAR participants used the time to prepare for the presentation of their posters and concepts. In the late morning, it was time for the finals in a packed lecture hall. Laura Scharm from Stiftung Mercator, which sponsors HAR and RMS, welcomed all participants and briefly went into the goals and tasks of the foundation in the field of education and structural change in the Ruhr region. She expressed her sincere thanks to all participants and the organization team for the successful event.

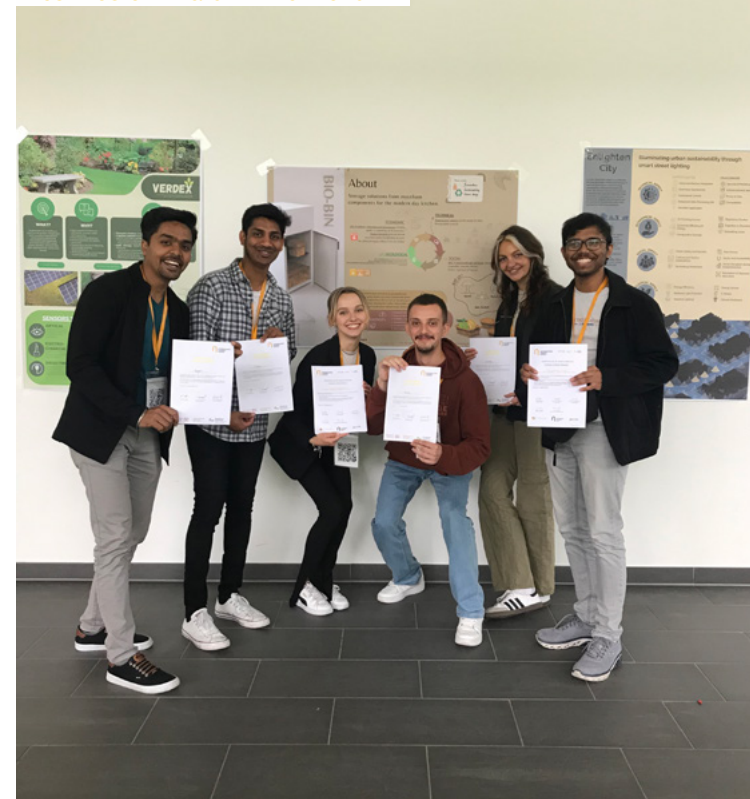
She then took up her role as juror for the gallery walk. Together with Prof. Dr. Stephan Weyers (Vice Rector Teaching and Studies, FH Dortmund) and Daniela Rings (Coordinator HAR) she had to choose the best poster and most convincing concept. In a five-minute pitch, each of the five groups had the chance to present their ideas around sustainable logistics and supply. The ideas included innovative storage and recycling solutions, improvement of the infrastructure

of energy supply of a hostel and light systems of urban areas. No easy task for the three jurors!

Finally, the decision was made: The Group "Bochum" with its storage solution made from mycelium components for the kitchen „Bio-Bin“ won the competition. The group jointly presented their project idea and also presented their own design, with which they convinced the jury and were the happy winners. However, at least all participants have won: unforgettable memories of two exciting and intercultural weeks in Ruhr Metropolis

The two weeks have gone by so fast! At the end, all students, teachers, jurors and organizers met at Kostbar to review the time in the Summer School with pizza and ice cream and to make plans for the future: Through the teachers, the cooperation between the universities could be strengthened and expanded. The students made new friends and networked worldwide.

Best Poster Award Winner 2023



Summer School Participants 2023



Ice cream bike



A big 'thank you' to all those who contributed to the success of the Summer School – especially to all students and lecturers, who supported the event with their attention, their questions and opinions, and their expertise!

