



OTTO VON GUERICKE
UNIVERSITÄT
MAGDEBURG

INSTITUTE OF
LOGISTICS AND
MATERIAL HANDLING SYSTEMS

INTERNATIONAL SUMMER SCHOOL ON SIMULATION AND ARTIFICIAL INTELLIGENCE

“Artificial intelligence, process design, modelling and simulation virtually all over Europe in 12 Days.” - Learn how to combine Artificial Intelligence with Simulation Modelling to encounter problems in Production and Logistics.”



PRODUCTION AND LOGISTICS

SEE WEBSITE

WWW.ILM.OVGU.DE/SUMMER_SCHOOL_SIMULATION



PARTNERS



INTERNATIONAL SUMMER SCHOOL

A high-quality consortium of European educational institutions has come together to host an international summer school on Artificial Intelligence and Simulation. The summer school is an exceptional opportunity to acquire knowledge, gain cultural experience and build an international network in a compact form.



Otto-von-Guericke-Universität (OVGU) Magdeburg is a comprehensive university with about 14.000 students. It provides bachelor, master and PhD programmes with an emphasis on Artificial Intelligence, simulations and modelling as well as systems engineering.



Zaragoza Logistics Center (ZLC) Zaragoza is a private, state-accredited university specialising in high-quality degree programmes and continuing education programmes for logistics professionals. It focuses on logistics process design and supply chain management. ZLC is part of Global Scale Network of the Massachusetts Institute of Technology (MIT).



Ostbayerische Technische Hochschule (OTH) Regensburg is a technical university of applied sciences with about 11.000 students. It offers practice-oriented bachelor and master degree programmes in engineering and business studies with specialisations in material flow and factory simulation.



Transport and Telecommunication Institute (TSI) Riga is a private, state-accredited university specialising in attractive degree programmes for students either as full-time, part-time, modular or distance learning. They are focused on transport, IT, robotics, logistics and aviation.



MODULES

The summer school is composed to provide a variety of complementary contents and modules in the field of AI and process modelling in production and logistics.

MODULE 1 GETTING STARTED – VIRTUAL ONBOARDING

The Summer School offers a virtual onboarding format for individual preparation on the contents. The following topics will be addressed:

- Introduction of process modelling and discrete-event simulation in production and logistics
- Introduction of optimization approaches in production and logistics

MODULE 2 INTRODUCTION OF TOOLS, SOFTWARE AND PROGRAMMING

A basic introduction and general training for important tools and useful associated skills are provided, such as PlantSimulation, AnyLogic, ExtendSim and Python.

MODULE 3 FUNDAMENTS OF MODELLING AND SIMULATION

The module teaches simulation modelling for complex systems in production and logistics. The main paradigms of simulation are presented and differences are highlighted.

MODULE 4 SIMULATION-BASED OPTIMIZATION AND EVOLUTIONARY ALGORITHMS

Simulation-based optimization as well as the model as a „black-box“ function are considered.

Evolutionary computations for logistics are introduced to get familiar with the variety of evolutionary algorithms and to understand differences.

MODULE 5 SIMULATION “HACKATHON”

Group work on a tricky problem in the field of logistics. The previously acquired knowledge is applied in practice.

MODUL 6 ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Overview of general paradigms of Machine Lear-



ning. Introduction and application of open-source Machine Learning libraries for typical problems related to production and logistics. Introduction on the concept of agents in sense of Artificial Intelligence.

MODULE 7 **CASE STUDIES ON ARTIFICIAL INTELLIGENCE AND SIMULATION**

Case studies from different business sectors are presented and worked on in multinational teams. Applications in production, transport and intralogistics contexts are included. The following processing steps are worked out and presented in a structured way:

- Problem analysis and modelling,
- Identification of solution strategies,
- Development of concepts for the simulation model incl. Artificial Intelligence components,
- Processing and assessment of the case study results,
- Preparation of presentation

Topics of the case studies: Application of simulation modelling and reinforcement learning to solve optimization problems in production and logistics

MODULE 8 **INTERCULTURAL EXPERIENCE**

Introduction of opportunities for degree- and PhD-programs by international offices of universities. Presentation of participating cities. Introduction of language and culture.

During the summer school the lecturers use modern and collaborative formats to share contents and at the same time to enable interaction with the participants.

- Virtual tours through companies and laboratories
- eLearning platform for organization and systematic availability of content
- Video tutorials and lectures
- Interactive working on case studies, solutions development and presentations
- Q&A sessions
- Online-supported evaluations to gather feedback on a daily basis



„Our international summer school is an exceptional opportunity to experience logistics simulation and optimisation techniques in a compact form. It offers the opportunity to understand in depth the potential of virtual modelling and process improvement basing on artificial intelligence in various fields, while learning about the latest tools. – All this from both a theoretical and practical point of view. Thanks to the participants, we hope for spirit of a progressive teamwork and good networking, despite a world still slowed down by Covid19.“

*Dr.-Ing. Tobias Reggelin, Faculty of Mechanical Engineering,
Institute of Logistics and Material Handling (ILM),
Magdeburg, Germany*

FACTS AND FIGURES

DURATION	12 days
DATE	August*
LANGUAGE	English
OBJECTIVE	<ul style="list-style-type: none"> - Preparation for new tasks in logistics simulation and optimisation or deepening of simulation know-how - Improvement of skills in complexity management, problem solving, intercultural competence and presentation
CONTENTS	<ul style="list-style-type: none"> - Development of a comprehensive understanding of Simulation, virtual modelling and the use of artificial intelligence in the field of production and logistics - Introduction and application of up-to-date tools and software
SEMINAR FEE	The seminar fee is quoted on our website
IMPORTANT DATES	Application deadline: July* 10 % “Early Bird” discount deadline: April*
TARGET GROUP	Master students Graduates Trainees Professionals
COMPLETION	Education Program Certificate

* Please see website for exact dates.

FIND US ALL OVER EUROPE

Feel free to contact us if you have any questions. We are always happy to help. – You can find the specific contacts of the network partners for summer schools and study programmes on our website. Just follow the QR code.

For more information about the partners, visit the campuses and meet the student advisors or check our websites.

Otto-von-Guericke-Universität
Magdeburg (OVGU)
Universitätsplatz 2
39106 Magdeburg (Germany)
www.ovgu.de

Ostbayerische Technische Hochschule
Regensburg (OTH)
Prüfeninger Straße 58
93049 Regensburg (Germany)
www.oth-regensburg.de

Zaragoza Logistics Center (ZLC)
Avenida Ranillas 5, edificio 5A (EXPO), planta baja
50018, Zaragoza (Spain)
www.zlc.edu.es

Transport and Telecommunications Institute (TSI)
Lomonosova street 1,
Riga, LV-1019 (Latvia)
www.tsi.lv



SEE YOU AT OUR CAMPUSES

Why don't you come and visit us on one of our network partners' campuses? You are welcome to arrange a personal meeting – they will all be pleased to show you around or tell you about our research, course offerings, the projects and student life.

SUMMER SCHOOL ADMINISTRATION

Phone: +49 (0)391 67-57323

E-Mail: paul.reichardt@ovgu.de

Institute of Logistics and Material Handling Systems (ILM)

Universitätsplatz 2

39106 Magdeburg

www.ilm.ovgu.de

For further information and registration,
please refer to our website:

www.ilm.ovgu.de/Summer_School_Simulation

