Maximilian Selmair

Modelling and Simulation Lead · freelance partner

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PROFILE

Simulation engineer building data-infused models of manufacturing and logistics systems. Focus on material flow optimisation, production ramp-up and large-scale fleets of autonomous mobile robots, backed by a PhD on task allocation for 100-robot systems and 20 publications since 2014.

EXPERIENCE

since 2023

Modelling and Simulation Lead (freelance partner)

EFESO Management Consultants

Data-infused simulation models for clients across industries worldwide, targeting material flow, production scheduling and optimal buffer capacities.

2021 – 2024

Manufacturing Ramp-up and Material Flow Conceptualization

Tesla · Giga Factory Berlin

Led the simulation efforts supporting the ramp-up of Giga Factory Berlin. Analysed manufacturing systems over extended virtual timeframes with AnyLogic, enabling high-stakes decisions to be tested before implementation.

2017 – 2021

PhD Student

BMW Group · University of Plymouth

Optimising operations for fleets of autonomous mobile robots: strategies for allocating immediate transportation and charging tasks in large-scale systems (100 robots, 50,000 m² assembly hall).

2014 – 2016

Material Flow Simulation

SimPlan

Plant Simulation, SimAssist, SQLite.

EDUCATION

2017 – 2021

Doctoral student

University of Plymouth

Optimising Operations for Fleets of Autonomous Mobile Robots: Strategies for allocating immediate Transportation and Charging Tasks in large-scale Systems.

07|2014 – 09|2017

Doctoral student

Technische Universität Dresden

Doctorate in sustainable production planning (not completed).

03|2013 – 07|2014

Logistics, Master of Arts

OTH Regensburg

Thesis: Automatisierung in der SAP GUI per Scripting. Supervisor: Prof. Dr. Frank Herrmann. Final grade 1.0. Awarded the Christa-Lindner-Preis 2014.

10|2009 – 02|2013

Business Information Technology, Bachelor of Science

OTH Regensburg

Thesis: Planung und Realisierung einer Unternehmensneugründung. Supervisor: Prof. Dr. Alexander Söder. Final grade 1.3.

SKILLS

Simulation	AnyLogic, Plant Simulation, discrete event and agent-based modelling, experiment design, statistical scenario comparison
Domains	Material flow, production scheduling, ramp-up planning, AMR and AGV fleets, buffer sizing, energy-aware planning
Technical	Java, SQL / SQLite, IBM ILOG CPLEX, operations research methods (ILP, Hungarian method, VAM)
Languages	German (native), English (fluent)

PUBLICATIONS

2027

Streamlining stochastic transportation requests to AMR fleets: An optimal allocation algorithm for single-transports

SELMAIR · In development

07|2024

Advanced Random Number Implementation Techniques: A Guide towards Reliable Scenario Comparisons in Simulation Modelling

SELMAIR / MONAKHOV · Modelling and Simulation in Engineering

06|2024

Foundational Statistical Methods in Comparative Design for Simulation Experiments

TOLBA / SELMAIR · 38th European Conference on Modelling and Simulation

05|2022

Taking randomness for granted: the complexities of applying random number streams in simulation modelling

SELMAIR · 36th European Conference on Modelling and Simulation

02|2022

Enhancing the efficiency of charging & parking processes for Autonomous Mobile Robot Fleets: A simulative evaluation

SELMAIR / MAURER / LAI / GRANT · Journal of Power Sources

11|2021

The dark side of the database

SELMAIR / WÖHE · Guest-Blog for The AnyLogic Modeler

09|2021

Optimizing large-scale AMR fleet operations

SELMAIR · AnyLogic Conference 2021

06|2021

Evaluation of algorithm performance for simulated square and non-square logistic assignment problems

SELMAIR / HAMZEHI / MEIER · 35th European Conference on Modelling and Simulation

02|2021

Agent-based simulation model for AMR research

SELMAIR · Model of the month (February 2021)

12|2020

Improved decentral task allocation for AGV systems based on Karis Pro

SELMAIR / MEIER · AKWI Journal

10|2020

Enhancing charging & parking processes of AGV systems: Progressive theoretical considerations

SELMAIR / MAURER · The Twelfth International Conference on Advances in System Simulation

05|2020

Efficient task prioritisation for Autonomous Transport Systems

SELMAIR / PANKRATZ / MEIER · 34th European Conference on Modelling and Simulation

04|2020 **Towards ASP-based scheduling for industrial transport vehicles**
FABRICIUS / DE BORTOLI / SELMAIR / REIP / STEINBAUER / GEBSER · Joint Austrian Computer Vision and Robotics Workshop 2020

09|2019 **Scheduling charging operations of autonomous AGVs in automotive in-house logistics**
SELMAIR / HAUERS / GUSTAFSSON-ENDE · Simulation in Production and Logistics 2019

06|2019 **Solving non-quadratic matrices in assignment problems with an improved Version of Vogel's Approximation Method**
SELMAIR / SWINAREW / MEIER / WANG · 33rd European Conference on Modelling and Simulation

06|2017 **Exploring opportunities: Optimising production planning by Factoring in Energy Procurement and Trading Options**
SELMAIR / HANFELD / CLAUS / HERRMANN · Simulation Notes Europe

05|2016 **Job shop scheduling with flexible energy prices**
SELMAIR / CLAUS / HERRMANN / TROST · 30th European Conference on Modelling and Simulation

05|2016 **Social and ecological capabilities for a sustainable hierarchical production planning**
TROST / CLAUS / HERRMANN / TEICH / SELMAIR · 30th European Conference on Modelling and Simulation

09|2015 **Potential of reducing the total energy consumption by Scheduling a Jobshop Production System**
SELMAIR / HERRMANN / CLAUS / TEICH · Simulation in Production and Logistics 2015

07|2014 **Automatisation of the SAP GUI via scripting**
SELMAIR / HERRMANN / HAMMER · Ostbayerische Technische Hochschule Regensburg