KARINA SINDERMANN

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EDUCATION

University of Nebraska-Lincoln *August 2022 - Present*
Doctoral Student in Supply Chain Management and Analytics

University of Augsburg, Germany *October 2019 - May 2022*
Master of Science in Business and Information Systems Engineering
Thesis: "Optimization of medical staff scheduling using mathematical programming at the University Hospital of Augsburg"

University of Augsburg, Germany *October 2015 - September 2019*
Bachelor of Science in Business and Information Systems Engineering
Thesis: "Development of a model for solving vehicle routing problems with time windows (VRPTW) in the field of home health care - additional programming of the models in IBM ILOG CLPEX"

EXPERIENCE

University of Nebraska-Lincoln *August 2022 - Present*
Graduate Research Assistantship in the Supply Chain Management and Analytics Department

Infra Construct Bau Ltd., Wallersdorf, Germany *April 2021 - October 2021*
Intern

University of Augsburg, Germany *October 2020 - March 2021*
Research Assistant in the Health Care Operations/Health Information Management Department,

University Hospital Augsburg, Germany *October 2012 - February 2013*
Nursing Assistant at the VITA (care unit for integrated traumatology in old age)

ACADEMIC PROJECTS AND RESEARCH EXPERIENCE

Industrial Vending Machine Optimization Research *2023 - Present*
- Developing state-dependent and fixed-cycle replenishment policies for industrial vending machines using Markov decision processes
- Implemented a near-optimal online control framework scalable to hundreds of items using approximation methods
- Demonstrated 61-78% potential cost reduction compared to current industry practice using real transaction data
- Applied techniques: Stochastic optimization, control theory, mathematical programming

Masters Research, University of Augsburg, Germany *May 2022*
- Developed a mathematical optimization model to improve duty schedules for anesthesiologists, considering workload and fairness aspects.
- Implemented the model using CPLEX and achieved a significant reduction in scheduling time.
- Innovatively combined structures of relational databases and optimization techniques to formulate an efficient model.

PUBLICATIONS AND MANUSCRIPTS

Under Review

- Sindermann, K. M., Gel, E. S., Erkip, N. K. (2024). "Optimal Replenishment Policies for Industrial Vending Machines." Under review at *Operations Research*.

  Preprint available at: `arxiv.org/abs/2503.13643`

- Sindermann, K., Schüller, M., Brunner, J. O. (2024). "Optimizing Physician Scheduling at Kempten Hospital: A Database-Driven Mathematical Programming Approach." Under revision at *INFORMS Journal on Applied Analytics*.

ACADEMIC SERVICE

Journal Reviewer

- *IISE Transactions* *2024*
- *Transportation Research Part E: Logistics and Transportation Review* *2023*

ACTIVITIES

auxHOT - Augsburg Healthcare Operations Talents *August 2019 - May 2022*

- Member of a healthcare operations group aimed at fostering research and academic collaboration.

SKILLS

Mathematical Optimization: CPLEX (DOcplex), Excel Solver
Programming Languages: Python, C
Database Management: SQL
Languages: Fluent in English and German

AWARDS AND SCHOLARSHIPS

Ogle Fellowship, University of Nebraska-Lincoln *August 2022 - Present*
Chancellor Fellowship, University of Nebraska-Lincoln *August 2022 - July 2023*