

# Pascal Strauch

MECHANICAL ENGINEERING · SOFTWARE DEVELOPMENT

A versatile and proactive Mechanical Engineer with a strong foundation in both traditional engineering principles and modern software development. Passionate for innovation and a natural curiosity for exploring new technologies, constantly seeking opportunities to expand my knowledge and expertise.

## Experience

### Conference Speaker

ASHRAE Winter Conference

February 2025

Orlando, FL, U.S.A.

- Presented research on optimizing residential energy systems using Model Predictive Control (MPC) to reduce operational carbon emissions
- Development and comparison of MPC strategies to evaluate cost vs. emissions trade-offs

### Working Student

Siemens AG

Dec. 2023 - Dec. 2024

Karlsruhe, Germany

- Developing and testing of innovative sensor technologies
- Mobile app development initiative for condition monitoring
- Prototyping, integration with actuators and sensors, mobile dashboard
- Implementing computer-vision and creating anomaly detection

### Research Scholar

UNC Charlotte

April - Oct. 2023

Charlotte, NC, U.S.A

- Modeling of a residential building with distributed energy resources such as PV, batteries, and electric vehicles
- Design and implementation of optimized control strategy (MPC)
- Presentation of study results in Energy and Buildings Journal

### Developer

QualiMe

Nov. 2022 - Present

Karlsruhe, Germany

- Development of lifestyle mobile app

### Research and Development Engineer

Bosch Thermotechnik

May 2022 - Sep. 2022

Wernau, Germany

- Modeling, development, and automation of component tests for a ventilation system in residential buildings
- Built and validated a physics-based model of a heat exchanger

## Education

### Master of Science in Mechanical Engineering

Karlsruhe Institute of Technology (KIT)

Oct. 2022 - Present

- Specializing in Automation Technology and Medical technology
- Master's thesis: Expert-Informed Soft Sensors: Development of a Hybrid Framework

### Bachelor of Science in Mechanical Engineering

Karlsruhe Institute of Technology (KIT)

Oct. 2018 - Sep. 2022

- Specializing in Energy Technology
- Bachelor's thesis: User-oriented building control for thermal comfort

## Publications

- P. Strauch, W. Wang, and F. Langner. Model predictive control for demand flexibility of a residential building with multiple distributed energy resources. *Energy and Buildings*, 305:113884, 2024
- M. Frahm, P. Zwickel, J. Wachter, F. Langner, P. Strauch, J. Matthes, and V. Hagenmeyer. Occupant-oriented economic model predictive control for demand response in buildings. In *Proceedings of the Thirteenth ACM International Conference on Future Energy Systems*, e-Energy '22, page 354–360, New York, NY, USA, 2022. Association for Computing Machinery

## Contact

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## Skills

### Engineering

Modeling & Simulation	+++
Thermodynamics	+++
Machine Learning	+++
System Automation	++
Robotics	+

### Programming

MATLAB/Simulink	+++
Python	+++
JavaScript	+++
C++	+

### Languages

English	C2
German	Native
Spanish	A2