Ruochen WU

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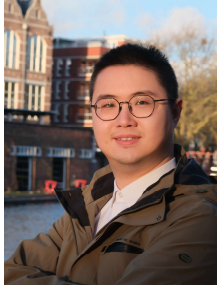

EDUCATION BACKGROUND

Delft University of Technology (TU Delft) 09/2023 – today

MSc. in Multi-Machine Engineering(MME), Mechanical Engineering | Weighted Average Score: 8.2/10.0

Courses: Control System Design | Reliability & Maintenance of Transport Equipment | Operation & Maintenance | Measurement Technology | Machine Learning for Transport and Multi-Machine System | System Analysis and Simulation

Central South University (CSU) 09/2018 – 06/2022

B.Eng. in Transportation Equipment and Control Engineering | **GPA:** 3.47/4.0 (WES)

Courses: Advanced Mathematics | Linear Algebra | Probability and Statistics | Analog Electronics Technology | Digital Electronics Technology | Artificial Intelligence and Automatic Drive | Vehicle Structural Strength and Dynamics (ANSYS)

RESEARCH EXPERIENCES

TU Delft, AI Energy Lab & Austrian Institute of Technology (AIT) 09/2024 – today

AI for Science – Interpretable Intraday Price Prediction Integrating Kolmogorov-Arnold Networks (KANs) and Large Language Models (LLMs)

Master Graduation, Supervisor: Dr. Jochen CREMER & Dr. Peyman Mohajerin Esfahani

- Designed a price prediction model for intraday electricity market with actionable trading insights.
  - Built a Torch-based *deep learning* predictive model for intraday electricity prices using time-series data.
  - Enhanced model transparency & interpretability with KANs, integrating the concept of *AI for science*.
  - Utilized LLMs to analyze training outcomes and derive interpretable predictive formulas.

TU Delft, AI Energy Lab & Austrian Institute of Technology (AIT) 10/2024 –12/2024

Feasibility Study – Review of Forecasting Continuous Intraday (CID) Electricity Prices

Literature Research, Supervisor: Dr. Jochen CREMER & Dr. Peyman Mohajerin Esfahani

- Reviewed CID price forecasting literature and proposed new forecasting schemes.
  - Conducted a comprehensive analysis of existing *statistical and deep learning models* for CID prices forecasting.
  - Redefined the ideal CID forecasting model to capture regional characteristics of EU markets.
  - Proposed a unified multi-layered forecasting model concept, demonstrating high feasibility and interpretability.

TU Delft, Adaptive Metastructures, Mechanisms and Machines Lab (JAM Lab) 09/2024 –01/2025

Robotic Optimization – Multi-Sensor Fusion for Soft Robot Pose Estimation Using Co-Training Method

Core Member, Supervisor: Dr. Jovana JOVANOVA

- Perceived and detected the dynamic posture of a novel soft robotic arm.
  - Utilized a 3D camera module to detect the *multi-directional posture* of a soft robotic arm.
  - Integrated IMU and 3D camera data into a *semi-supervised* mutual supervision framework to minimize errors.

TU Delft, Adaptive Metastructures, Mechanisms and Machines Lab (JAM Lab) 06/2024 – 10/2024

Robot Creation – Integration System Design of SMA-SMP Based Morphing Structure for Soft Robotics

MSc Research Assignment, Supervisor: Dr. Jovana JOVANOVA & Dr. Aaron Chen

- Developed a morphing structure and integrated control systems for advanced transformations.
  - Designed and fabricated the first SMM-based *soft robotic* system enabling dynamic and continuous operations.
  - Developed an *unsupervised learning* system with *image recognition* based on IR cameras for temperature detection.
  - Implemented a closed-loop *control system* with a PID controller for real-time and accurate shape adjustments.

CSU, Key Laboratory for Rail Traffic Safety 02/2021 – 07/2021

Robot Creation – An Automatic Service Robot in Train Compartments

Team Leader, Advisor: Dr. Fan WU

- Designed an autonomous service robot prototype for high-speed railway systems with multiple functions.
  - Implemented SLAM-based navigation with LIDAR and RRT for *positioning* and *obstacle avoidance*.
  - Developed *mechanical* and *electronic* systems for wheeled locomotion for omnidirectional, smooth movement.
  - Developed a real-time system for air bacteria monitoring and disinfection.

PUBLICATIONS

Multi-Sensor Fusion for Soft Robot Pose Estimation Using Co-Training Method — Submitted

Integration System Design of SMA-SMP Based Morphing Structure for Soft Robotics — Under Review

Numerical comparison of ventilation modes on the transmission of coughing droplets in a train compartment. *Journal of Wind Engineering and Industrial Aerodynamics*. 231. 105240. 10.1016/j.jweia.2022.105240.

SKILLS & PROFICIENCIES

Technical Skills: Python, C++ programming, Deep Learning, Robotics Design and Control, Image Recognition, FEM

Languages: Mandarin (*Native speaker*), English (*Proficient*, IELTS 7, GRE 330+4.0)

Hobbies: Basketball, Saxophone