

CONTACT

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HAOMING ZHANG

Robotics - Mechanical Engineering

EDUCATION

Ph. D. - Mechanical Engineering

RWTH Aachen University, Germany

2020 - 2025

Topic: Uncertainty Quantification in Factor Graphs for Vehicle Localization

M. Sc. - Mechatronics

University of Duisburg-Essen, Germany

2015 - 2016

B. Sc. - Mechanical Engineering

University of Duisburg-Essen, Germany

2012 - 2015

WORK EXPERIENCE

Research Associate

Institute of Automatic Control, RWTH Aachen Uni.

Research on state estimation and learning-based inference;
Project: autonomous shipping

Jul 20 - Aug. 24

Research Associate

Cybernetics Lab, RWTH Aachen Uni.

Research/Teaching: state estimation and trajectory planning;
Project: human/robot collaboration and mobile manipulation

May 17 - Jun 20

Student Research Associate

Chair of Dynamics and Control, Uni. Duisburg-Essen

Research: simulation design for autonomous driving

May 16 - Feb 17

PUBLICATIONS

◇: first author

Learning-based GNSS Uncertainty Quantification using Continuous-Time Factor Graph Optimization
1st German Robotics Conference

DOI: 10.48550/arXiv.2503.04933

◇ 2025

GNSS/Multi-Sensor Fusion Using Continuous-Time Factor Graph Optimization for Robust Localization
IEEE Transactions on Robotics

DOI: 10.1109/TRO.2024.3443699

◇ 2024

Learning-based NLOS Detection and Uncertainty Prediction of GNSS Observations with Transformer-Enhanced LSTM Network
Proc. of IEEE 26th Int. Conf. on Intelli. Trans. Syst.

DOI: 10.1109/ITSC57777.2023.10422672

◇ 2023

Object Detection and Heading Estimation from Radar Raw data
Proc. of 34th IEEE Intelligent Vehicles Symposium

DOI: 10.1109/IV55152.2023.10186591

2022

RESEARCH INTEREST

State Estimation

Kalman filters
Graph Optimization
GNSS & SLAM & Sensor Fusion

Variational Inference

Variational Bayes
Parameter Tuning
Online Model Identification

Deep/Reinforcement Learning

Object Recognition
Active Perception

SKILLS

C++ & Python	7+ yrs
ROS	7+ yrs
Machine Learning	5+ yrs
Teaching	3+ yrs
Web Development	<1 yrs

LANGUAGES

English
Proficient (C1)

German
Fluent (C2)

Chinese
Native

Continuous-Time Factor Graph Optimization for Trajectory Smoothness of GNSS/INS Navigation in Temporarily GNSS-Denied Environments
IEEE Robotics and Automation Letters

DOI: 10.1109/LRA.2022.3189824

◇ 2022

Predicting basin stability of power grids using graph neural networks
New Journal of Physics

DOI: 10.1088/1367-2630/ac54c9

2022

PROJECTS

MuSEAS: multi-sensor dataset with annotations for ship automation

Role: Project Leader

Visual odometry; Multi-sensor fusion; Mapping;
Hardware/Software concept; Project management

2023-2024

FernBin: Remote-controlled and coordinated driving in land shipping

Role: Project Leader

Robust ship localization; Sensor fusion; Hardware/Software concept;
Project management

2020-2024

UrbANT: urban, automated, user-oriented transport platform

Role: Project Collaborator

Outdoor Robot localization; Object detection/tracking;
Robot design and prototyping; Project management

2019-2020

ARIZ: work in the industry of the future

Role: Project Collaborator

Indoor robot localization/SLAM;
Trajectory planning of mobile/stationary robots

2017-2019

ACTIVITIES

3rd Workshop on Intelligent Vehicle Meets Urban: Safe and Certifiable Navigation and Control for Intelligent Vehicles in Complex Urban Scenarios

Role: Co-Organizer and Moderator

[More Information](#)

Edmonton, CA

2nd Workshop on Intelligent Vehicle Meets Urban: Safe and Certifiable Navigation and Control for Intelligent Vehicles in Complex Urban Scenarios

Role: Co-Organizer and Moderator

[More Information](#)

Bilbao, ES

Demonstrations of 33rd IEEE Intelligent Vehicles Symposium

Role: Organizer

[More Information](#)

Aachen, DE

Talk: Closing the Estimation Loop: Learning-based Uncertainty Quantification for Robust Vehicle Localization

Beijing, CN

Role: Presenter

Tsinghua University, 2024

Talk: Towards Robust Navigation Solution and Flexible Sensor Fusion in Challenging Inland Shipping Scenarios

Duisburg, DE

Role: Presenter

The Autonomous Inland and Short Sea Shipping Conference, 2022

Reviewer for:

AoE

IEEE T-RO/RA-L/T-AES/T-WC/Sensors
IEEE ICRA/IROS

References

AoE

Prof. Dr. Timothy D. Barfoot (tim.barfoot@utoronto.ca)
Prof. Dr. Heike Vallery (h.vallery@irt.rwth-aachen.de)
Prof. Dr. Dirk Abel (d.abel@irt.rwth-aachen.de)
Prof. Dr. Li-Ta Hsu (lt.hsu@polyu.edu.hk)