

# Dr. Ze Zhang

[Robotic & Automation Researcher]

## Contact



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## Education

Jan. 2020 - May 2025 (Defense date)

**Chalmers University of Technology (CTH)**

*Ph.D. in Automation Group, School of Electrical Engineering*  
(Gothenburg, SE)

Sept. 2024 - Nov. 2024

**University of Pennsylvania (UPenn)**

*Associate visiting student in GRASP Lab, School of Mechanical Engineering and Applied Mechanics*  
(Philadelphia, USA)

Sept. 2017 - Jan. 2020

**Chalmers University of Technology (CTH)**

*M.Sc. in Systems, Control, and Mechatronics (MPSYS), School of Electrical Engineering*  
(Gothenburg, SE)

Sept. 2013 - July 2017

**University of Electronic Science and Technology of China (UESTC)**

*B.Sc. in Automation, School of Automation Engineering*  
(Chengdu, CN)

## Profile

Greetings! I'm a researcher/engineer in robotics, computer vision, machine learning, control, and automation. I finished my Ph.D. at Chalmers and am continuing as a **postdoc** researcher working on Vision-Language-Action models and cloud robotics. Please find more details about me and my projects via the link to my page ↗.

## Professional & Project Experience

Sept. 2025 – Present

Gothenburg, SE

**Research project** at CTH (Network and System Group, supervised by Prof. Ahmed Ali-Eldin Hassan)  
“*Robotics and Computing Project on Vision-Language-Action (VLA) Models*”

- **Initiate and lead** the VLA project with several PhD and master's students ([preview](#) of the project).
- Build the pipeline of training, running, and deploying VLA models, both on the cloud and edge devices.

Jan. 2020 – May. 2025

Gothenburg, SE

**Research project** at CTH (Automation Group, supervised by Professor Knut Åkesson)  
“*Collision-Free Navigation of Mobile Robots with Multimodal Motion Prediction of Dynamic Obstacles*”

- Initiate and construct a vision system for environmental perception [OpenCV].
- Build neural networks to make multimodal motion predictions of dynamic obstacles and use unsupervised machine learning for post-processing [Pytorch, Scikit-learn].
- Construct an indoor transport system pipeline with a mobile robot fleet controlled via distributed model predictive control [Casadi, ROS 2].

Sept. 2024 – Present

Philadelphia, USA

**Research collaboration** at UPenn (GRASP Lab, supervised by Asst. Professor Nadia Figueroa)  
“*Proactive Obstacle Avoidance with On-Manifold Control Barrier Function in Dynamic Environments*”

- Integrate motion prediction with the on-manifold CBF (mCBF) method [Pytorch].
- Improve the adaptability of the mCBF control for dynamic environments [Google Jax].
- Evaluate the proposed method on a real Fetch robot.

Sept. 2024 – Oct. 2025

Gothenburg, SE

**Research project** at CTH (Automation Group, as initiator)  
“*Multi-Robot Navigation in Complex Environments through LiDAR and Vision*”

- Train DRL agents for robot navigation on cloud computers. [OpenAI Gym].
- Combine DRL with MPC for SOTA navigation performance based on LiDAR and vision data.
- Create an efficient coordination approach using decentralized DRL agents with distributed MPC controllers.

June 2018 – Aug. 2018

Gothenburg, SE

**Summer Intern** at Volvo Cars (Battery SW Design, supervised by Dr. Christian Fleischer)

- Process massive battery data from both the lab and the real world.
- Build battery state models based on deep learning methods [Tensorflow].

## Skills

- Python, C++, Matlab
- ROS 2
- Pytorch, Tensorflow
- OpenAI Gym, Google Jax
- Casadi (control), OpenCV
- Linux, Git, Overleaf, Inkscape
- GPU/CUDA, Cluster/Cloud
- Nvidia Xavier
- (Swedish driver's license B)

## Interests

- Climbing
- Badminton
- Movie

## References

### Supervisor (Postdoc)

**Ahmed Ali-Eldin Hassan**, Professor,  
Computer Science and Engineering, CTH  
**Email:** ahmed.hassan@chalmers.se  
**Phone:** +46 31 772 40 20

### Supervisor (PhD)

**Knut Åkesson**, Professor, Electrical  
Engineering, CTH  
**Email:** knut.akesson@chalmers.se  
**Phone:** +46 31 772 3717

### Advisor (academic)

**Nadia Figueroa**, Asst. Professor, GRASP lab,  
UPenn  
**Email:** nadiafig@seas.upenn.edu

### Supervisor (industrial, master's thesis)

**Christian Fleischer**, Ph.D.  
**Email:** christian@cognivity.ai

### Co-author

**Emmanuel Dean**, Senior Researcher  
**Email:** deane@chalmers.se

### Colleague

**Karinne Ramirez-Amaro**, Professor  
**Email:** karinne@chalmers.se

## Publications

Future-Oriented Navigation: Dynamic Obstacle Avoidance with One-Shot Energy-Based Multimodal Motion Prediction, *Robotics and Automation Letters (RA-L)*, 2025

Gradient Field-Based Dynamic Window Approach for Collision Avoidance in Complex Environments, *International Conference on Intelligent Robots and Systems (IROS)*, 2025.

Bird's-Eye-View Trajectory Planning of Multiple Robots Using Continuous Deep Reinforcement Learning and Model Predictive Control, *International Conference on Intelligent Robots and Systems (IROS)*, 2024

Prescient Collision-Free Navigation of Mobile Robots with Iterative Multimodal Motion Prediction of Dynamic Obstacles, *Robotics and Automation Letters (RA-L, presented at ICRA 2024)*, 2023

Collision-Free Trajectory Planning of Mobile Robots by Integrating Deep Reinforcement Learning and Model Predictive Control, *International Conference on Automation Science and Engineering (CASE)*, 2023

More previous papers, upcoming papers, video demos, and code can be found on [my page](#).

## Teaching Experience

- Supervisor of design projects (on deep learning, reinforcement learning, and control) with master's students.
- Supervisor of master's thesis project (cloud robotics).
- TA of master course: Model-based Development of Cyber-Physical Systems (real-time operating system).
- TA of bachelor's course: Automatic control

## Project Glance

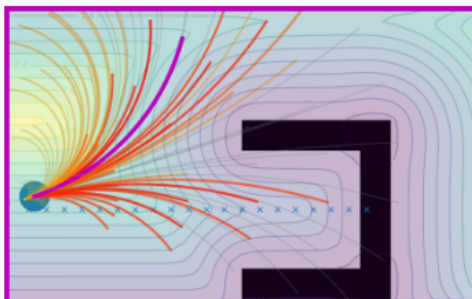
Multimodal motion prediction



Energy-based prediction and MPC



Gaussian process distance field and DWA



Motion prediction and MCBF

