

# Rong Zou

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## EDUCATION

**Eidgenössische Technische Hochschule Zürich (ETH Zürich)**

*Master of Science in Robotics, Systems and Control*

**Switzerland**

*Sep. 2021 – Present*

- Final grade: **5.94/6.0**

**University of Southampton (UoS)**

*Visiting Student in Ship Science*

**United Kingdom**

*Jan. 2019 – June 2019*

- Final grade: **81/100 (First Class)**

**Huazhong University of Science and Technology (HUST)**

*Bachelor of Engineering in Naval Architecture and Ocean Engineering*

**China**

*Sep. 2015 – June 2019*

- Final grade: **3.94/4.00, 92.3/100 (Ranking 1/112)**

## PUBLICATIONS

**Retrieval Robust to Object Motion Blur**

**Rong Zou**, Marc Pollefeys, Denys Rozumnyi. In *European Conference on Computer Vision*. 2024.

**Seeing Behind Dynamic Occlusions with Event Cameras**

**Rong Zou**, Manasi Muglikar, Nico Messikommer, Davide Scaramuzza. In *arXiv*. 2023.

**Path Tracking Control of Skid-steered Mobile Robot on Slope Based on Fuzzy System and MPC**

X. Yue, J. Chen, Y. Li, **R. Zou**, Z. Sun, X. Cao, S. Zhang. In *Int. J. Control Autom. Syst.* 2022.

## WORK EXPERIENCE

**Zürich Research Center, Huawei Technologies Switzerland AG**

*Computer Vision Research Intern*

**Switzerland**

*Mar. 2024 – Present*

- Conducted research on realistic image synthesis and deep learning-based image restoration to improve the quality of images captured by mobile phone cameras

**Robotic Systems Lab (RSL), ETH Zürich**

*Robotics Research Assistant*

**Switzerland**

*June 2021 – Dec. 2022*

- Contributed to the Autonomous River Cleanup project, responsible for data processing, front-end and back-end real-time communication, real machine testing and deployment

**Corporate Research - Asia Pacific, Bosch (China) Investment Ltd.**

*Robotics Research Intern*

**China**

*May 2021 – Aug. 2021*

- Improved the grasp planning algorithm for a robotic arm and verified the effectiveness by simulation
- Assembled and calibrated a robot gripper experimental platform and tested grasping stability on it

**State Key Laboratory of Intelligent Manufacturing Equipment & Technology, HUST**

*Robotics Research Assistant*

**China**

*Sep. 2019 – Sep. 2020*

- Developed improved particle swarm optimization algorithm for mobile robot global path planning
- Developed MPC-based algorithm for path tracking control of skid-steered wheeled mobile robots

## PROJECTS

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### Monocular Depth Estimation with Virtual View Supervision

Feb. 2023 – June 2023

- Proposed leveraging Neural Implicit Surface Reconstruction methods to augment a limited-scale dataset via scene reconstruction and virtual view-depth pair generation for the training of supervised MDE networks
- Rendered images from Replica scenes as the base dataset, trained MonoSDFs for novel RGBD data generation
- Conducted extensive experiments, demonstrating significant improvements in DeepLabV3+ network MDE performance when using novel views as additional supervision signals

### Computer Vision and Deep Learning for Autonomous Driving

Mar. 2022 – July 2022

- Fused multimodal driving data, identified laser ID from a given point cloud using K-means clustering, projected the LiDAR point cloud onto camera images and eliminated motion distortion with GPS/IMU data
- Constructed a multi-task learning architecture based on the DeepLabV3+ model for semantic segmentation and monocular depth estimation, ablated network architecture and improved the base network performance
- Created a 3D object detector to detect vehicles from LiDAR data, and studied the impact of canonical transformations and data augmentation on the box refinement stage of the detector

### Vision-based Control for A Ball-balancing Robot

Feb. 2022 – May 2022

- Set up and calibrated the Pixy2 camera for object tracking; obtained the ball's pixel coordinates from the camera and transformed them into world coordinates for positional control
- Filtered the visual signal using Butterworth filter to effectively estimate ball velocities for PID control, implemented inverse kinematics of robotic arms to calculate servo angles from PID output
- Set up the ball balancing robot platform and tested algorithms in an Arduino microcontroller, successfully achieved perturbation-free self-balancing as well as specified trajectory tracking of the ball

### Monocular Visual Odometry for Mobile Robots

Nov. 2021 – Jan. 2022

- Extracted and matched SURF features between keyframes and used the P3P algorithm for pose estimation
- Implemented sliding-window bundle adjustment to reduce reprojection errors and optimize estimated poses
- Performed loop detection based on a BoW model as well as global trajectory optimization for loop closure

## HONOURS AND AWARDS

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### Excellent Graduation Thesis

Huazhong University of Science and Technology

Top 1/112

2019

### National Encouragement Scholarship

Ministry of Education of the People's Republic of China

Top 3%

2018

### National Scholarship

Ministry of Education of the People's Republic of China

Top 0.2%

2016, 2017

### Model Student of Self-improvement

Huazhong University of Science and Technology

Top 0.1%

2017

### Exceptional Undergraduate

Huazhong University of Science and Technology

Top 1%

2017

### Merit Student

Huazhong University of Science and Technology

Top 3%

2016, 2017, 2018

## SKILLS

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**Programming:** Python, C++, Matlab, C, JavaScript

**Software / Framework:** Pytorch, OpenCV, ROS, Blender

**Languages:** Chinese (native), English (C1 - proficient), German (basic)

**Others:** Git, Latex, Anaconda, Docker