Rong Zou

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EDUCATION

Eidgenössische Technische Hochschule Zürich (ETH Zürich) **Switzerland**
Master of Science in Robotics, Systems and Control *Sep. 2021 – Present*
- Final grade: **5.94/6.0**

University of Southampton (UoS) **United Kingdom**
Visiting Student in Ship Science *Jan. 2019 – June 2019*
- Final grade: **81/100 (First Class)**

Huazhong University of Science and Technology (HUST) **China**
Bachelor of Engineering in Naval Architecture and Ocean Engineering *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

Computer Vision Lab, Zürich Research Center, Huawei Technologies **Switzerland**
Computer Vision and Machine Learning Research Intern *Mar. 2024 – Present*
- Conducted research on realistic image synthesis and deep learning-based image de-flickering to improve the quality of images captured by mobile phone cameras in dynamic scenes

Robotic Systems Lab (RSL), ETH Zürich **Switzerland**
Robotics Research Assistant *June 2022 – 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. **China**
Robotics Research Intern *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

School of Mechanical Science & Engineering, HUST **China**
Robotics Research Assistant *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

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, ableted 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

Excellent Graduation Thesis **Top 1/112**
Huazhong University of Science and Technology *2019*

National Encouragement Scholarship **Top 3%**
Ministry of Education of the People's Republic of China *2018*

National Scholarship **Top 0.2%**
Ministry of Education of the People's Republic of China *2016, 2017*

Model Student of Self-improvement **Top 0.1%**
Huazhong University of Science and Technology *2017*

Exceptional Undergraduate **Top 1%**
Huazhong University of Science and Technology *2017*

Merit Student **Top 3%**
Huazhong University of Science and Technology *2016, 2017, 2018*

SKILLS

Programming: Python, C++, Matlab, C, JavaScript, bash
Software / Framework: Pytorch, OpenCV, ROS, Blender
Languages: Chinese (native), English (C1 - proficient), German (basic)
Others: Git, Latex, Anaconda, Docker