Helin (Henry) Cao

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Education

University of Bonn, Germany 10/2022 – now

Ph.D. Center for Robotics Bonn | Embodied AI @ Lamarr Institute
Topic: Geometry and Semantics Inference with Vision and LiDAR
Advisor: Prof. Dr. Sven Behnke

Technical University of Munich (TUM), Germany 10/2018 – 05/2022

M.Sc Electrical and Computer Engineering

Nanjing University of Aeronautics and Astronautics (NUAA), China 09/2014 – 06/2018

B.Eng Electrical Engineering and Automation

Research Interests

My research interests lie in the perception and understanding of 3D environments for robotics. Specifically, I am interested in **1)** Representation Learning for Scene Completion; **2)** Categorical & Instance & Open-world semantics representation for the 3D environment; **3)** Perception for robot manipulation and navigation.

Publications

ICRA 24'
SLCF-Net: Sequential LiDAR-Camera Fusion for Semantic Scene Completion using a 3D Recurrent U-Net
Helin Cao, Sven Behnke
Paper Video

Selected Experience

Team Member **RoboCup 2023 Bordeaux**
NimbRo@Home 02/2023 – 07/2023

RoboCup@Home - Open Platform League
Mentor: Dr. Raphael Memmesheimer

- Developing an Object Segmentation Module via Transfer Learning
- Implementing 'serve breakfast' task
- 4-th place among 18 qualified teams

Video

Master Thesis **Technical University of Munich**
Visual Computing & Artificial Intelligence Lab 09/2021 – 04/2022

3D Semantic Scene Completion for RGB-D Scans
Advisor: Prof. Dr. Matthias Nießner & Prof. Dr.-Ing. Eckehard Steinbach

Thesis Code Reference

Robotics Developer **AI Digital Solutions GmbH**
Autonomous Mobile Robot Development 11/2020 – 04/2021

Mentor: Prof. Dr. Vahid Salehi

- Hardware Integration: Mecanum omnidirectional wheel, RPLIDAR, Arduino, Jetson Nano,
- Software Deployment: ROS Navigation, Cartographer

Reference

Skills

- Programming: Python, C/C++, Shell, LaTeX
- Tools: PyTorch, ROS, Matlab/Simulink, Slurm, Container, OpenCV, Blender, Git
- Hardware: PAL Robot Tiago++, Jetson Orin Nano, Velodyne LiDAR, Realsense RGB-D camera
- Language: Chinese (native), English (C1), German (B2)