Zilong Deng

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EDUCATION

Universitat Zurich, Switzerland — Sep 2022–Aug 2025

M.Sc. in Informatics, majoring in Artificial Intelligence

- GPA: 5.7/6.0

Harbin Institute of Technology, China — Sep 2018-Jun 2022

B.Eng. in Mechanical Design, Manufacturing, and Automation (Shenzhen Campus)

B.Eng. in Computer Science and Technology (Shenzhen Campus)

- Dual Degrees | GPA: 91/100 | National Scholarship (top 0.2%) | Outstanding Graduate

PROJECTS & RESEARCHES

Incremental 3D Open-set Instance-Semantic Map Reconstruction — Mar 2025-Aug 2025

Computer Vision and Geometry Group, ETH Zurich | **Master's Thesis**

- Implemented an incremental pipeline for 3D high-quality instance map reconstruction and instance-level open-set semantic feature aggregation from RGB-D images.

MonoTracker: Monocular RGB-Only 6D Tracking of Unknown Object (BMVC 2025 Oral) — Sep 2023–Aug 2024

Computer Vision and Geometry Group, ETH Zurich

- Pose estimation and reconstruction of tiny, texture-less moving objects with RGB images and camera intrinsic as input.
- Estimated object poses by a robust optimizer with mono-depth predictions with noisy and inconsistent scales.
- Reconstruction and post-refinement of the scale factors and poses during NeRF training.

Lidar-Visual-Inertial Odometry (LVIO) with Gaussian Splatting — Mar 2024-Jun 2024

Robotic Systems Lab, ETH Zurich

- Incorporated LiDAR's depth instead of stereo-based depth to improve accuracy and consistency of GS SLAM.
- Implemented a loosely coupled, optimization-based LVIO system by fusing Lidar and RGB data.
- Outperformed other GS-SLAM methods by the time on localization accuracy and processing speed.

Vision-based Drone Flight via Reinforcement Learning — Sep 2024

Robotics and Perception Group, Universitat Zurich

- Based on the observation of 2D bounding boxes from the YOLO detector and the drone dynamics from MoCap System, an RL-based drone controller was trained to achieve a stable and smooth following of the target drone.
- Designed a set of reward functions to achieve smoothness and robustness of the vision-based following. A PPO model was trained with a drone dynamic model, and experiments were conducted in both drone simulator and real world.

Neural Representation-based Medical Microscopic Image Compression — Nov 2021-Jun 2022

International Research Institute for AI, Harbin Institute of Technology | **Bachelor's Thesis**

- Designed an Embedding-MLP-PixelShuffle pipeline to compress a single image based on neural representation.
- Designed a medical microscope image-based subsampling algorithm to reduce image size at the sending end and deployed a neural representation network for super-resolution of the decompressed image at the receiving end.

Multi-Arm Concentric Tube Robot for Minimally Invasive Surgery — Jul 2020-Jun 2022

Robot Perception and Artificial Intelligence Lab, Harbin Institute of Technology | **Bachelor's Thesis**

- Designed a fully functional system for clinical minimally invasive surgery. Including mechanical structure, kinematic modeling, and calibration on the multi-arm tube robot system.
- Designed a 6D pose detection algorithm for the end vision tag of continuum robots (C++).
- Designed a calibration algorithm for concentric tube robot and deployed inter-arm hand-eye calibration on the system.

WORKING

Internship b Computer Vision, Spatial Intelligence Model Dec 2024–Jul 2025

Zurich Research Center, Huawei Switzerland

- Research project on Structural Spatial-Temporal Consistent Forecasting of 4D Assets.

Teaching Assistant -- Informatics II; Machine Learning Feb 2024–Jan 2025

Department of Informatics, Universitat Zurich

- For Informatics II, I gave tutorials on Data Structure, Algorithms, and programming in C.
- For Machine Learning, I served as a teaching assistant for the lecture about statistical machine learning.

Internship -- Robot Embedding System Development May 2021–Aug 2021

DJI Innovation

- Participated in the National Robotic Competitions and performed technical presentations at DJI as an excellent team.
- Real-time visual recognition using modified YOLOv5 and target tracking using Extended Kalman Filter.
- Design a C language-based ROS-like framework for embedded system (STM32) of wheeled robots.

SKILLS

Programming Languages: C, C++, Python, MATLAB, JAVA, JavaScript
Software & Tools: Pytorch, Pybind, CMake, LaTeX, ROS, SOLIDWORKS, MySQL, Abaqus
Spoken Languages: Mandarin (Native), English(C1), Cantonese (Native), German (~B1)

HONORS & AWARDS

National First Prize in the 20th / 21st China National College Robotic Competition 'RoboMaster' *2021, 2022*
Regional Second Prize in the Mathematics Competition of Chinese College Students *2020*
Excellent Student Scholarship of Harbin Institute of Technology *2019,2020,2021*
Outstanding Student of Harbin Institute of Technology *2019,2020,2021*

OTHERS

Team leader of the robotic competition team at HIT Shenzhen campus. *2019 - 2021*
Champion of the university's football tournament, as captain and defender. *2019*
Third Place in the mixed team event of the university's badminton tournament, Men's doubles. *2019*