

Yingye Xin

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Research Interest

3D Vision, Robot Perception, (dynamic) SLAM, Robot Self-Exploration

Education

Technical University of Munich

M.Sc Robotics, Cognition, Intelligence, GPA 1.4/1.0

Munich, Germany

Oct 2020 – Oct 2023

Tongji University

B.Eng Vehicle Engineering (5 years), GPA 4.82/5.0

Shanghai, China

Sept 2015 – July 2020

Publication

- **Yingye Xin**, Xingxing Zuo, Dongyue Lu and Stefan Leutenegger. SimpleMapping: Real-Time Visual-Inertial Dense Mapping with Deep Multi-View Stereo. IEEE International Symposium on Mixed and Augmented Reality (ISMAR), 2023.

Research Projects

Smart Robotics Lab, Technical University of Munich

May 2022 – Present

Project: Online Scene Completion

Advisor: Dr. Xingxing Zuo, Sotiris Papatheodorou, Prof. Dr. Stefan Leutenegger

Developed a self-supervised scene completion network, which takes a TSDF model as input, infers geometry and colour of the unobserved scene and generates high-quality completed 3D models. Converted the network into TorchScript model and seamlessly integrated it into a real-time mapping system for online scene completion.

Thesis: Real-Time Visual Inertial Dense Mapping with Deep Multi-View Stereo

Advisor: Dr. Xingxing Zuo, Prof. Dr. Stefan Leutenegger

Proposed a real-time visual-inertial dense mapping system for high-quality 3D reconstruction using monocular images and IMU data with deep MVS networks. Achieved state-of-the-art performance in depth prediction and 3D reconstruction on multiple public datasets, especially in challenging scenarios in the EuRoC dataset, where the F-score improved by 39.7% compared to existing systems.

Computer Vision Group, Technical University of Munich

Oct 2021 – Mar 2022

Project: Visual-Inertial Odometry using Preintegrated IMU Factors

Advisor: Jason Chui, Simon Klenk, Prof. Dr. Daniel Cremers

Implemented a simplified version of stereo ORB-VIO based on preintegration theory, preintegrated IMU measurements between image frames, estimated biases and velocity, optimized camera poses using both reprojection error and IMU error. Compared to visual odometry in exercises, this visual-inertial odometry improves stability, and provides smoother trajectory estimation. On the EuRoC dataset, the ATE was reduced by 45%.

3D AI Lab, Technical University of Munich

Oct 2021 – Mar 2022

Project: Body Animation using OpenPose and CeresSolver

Advisor: Andrei Burov, Prof. Dr. Angela Dai

Developed a pipeline that uses OpenPose to first detect the human pose of RGB images as targets, then optimizes shape and pose parameters of the SMPL model as well as global rigid transformation using CeresSolver, and finally generates a virtual avatar in approximate shape and pose.

Cyber-Physical Systems Group, Technical University of Munich

April 2021 – Sept 2021

Project: Generation of Naturalistic Driving Data Using Imitation Learning

Advisor: Luis Gressenbuch, Xiao Wang, Prof. Dr.-Ing. Matthias Althoff

Made use of Generative Adversarial Imitation Learning (GAIL) to generate driving data that mimics human driving behavior but violates traffic rules on CommonRoad Framework, finished pioneer work in this topic, achieved promising results on highway scenarios, and provided valuable training and evaluation data for motion planning in autonomous driving in reinforcement learning processes.

Institute of Intelligent Vehicles, Tongji University

Dec 2019 – July 2020

Thesis: Research on 3D LiDAR SLAM SegMap

Advisor: Guanbei Wang, Prof. Dr. Guirong Zhuo

Analyzed and visualized each module of SegMap, including point cloud filtering, incremental segmentation, semantic feature extraction, loop closure detection, etc. Completed experiments to test efficiency and accuracy, and verified SegMap on a real-car platform (Baidu Apollo).

Working experience

driveblocks GmbH

Munich, Germany

Software Engineer (Intern)

May 2022 - Oct 2022

Advisor: Dr. Tim Stahl, Dr. Alexander Wischnewski

- Developed and improved motion estimation algorithms for autonomous driving trucks on ROS2, fused pose estimation from IMU, wheel speed sensors, and visual odometry using the Extended Kalman Filter, and tested on simulation platform and real-world datasets.
- Developed visual odometry algorithms based on Granite to estimate poses using monocular images with ROS interface, and tested algorithms on real-world datasets.

Cyber-Physical Systems Group, Technical University of Munich

Munich, Germany

Student Assistant (HiWi)

Oct 2021 – Mar 2022

Advisor: Sebastian Maierhofer

Developed CommonRoad framework, converted CommonRoad-IO elements in version 2020a to 3.0, separated obstacles and road networks, redefined intersection elements, modified and tested FileWriter and FileReader.

Honour & Award

Excellent Graduate of Tongji University, 2020

Patent for Utility Model named “wireless braking system”, 2019

National Undergraduate Innovation Programs Certificate, 2018

China National Scholarship, 2018

First Prize of Tongji Scholarship of Excellence, 2016, 2017, 2019

Skills

Language: English(fluent), German(basic), Chinese(native), Cantonese(native)

Programming: Python, PyTorch, C++, CUDA, Linux, ROS, Git, CMake, LaTeX

Engineering: AutoCAD, Inventor, Matlab/Simulink, Micro-controller Unit, Altium Designer