Dongyue Lu

Curriculum Vitae

Department of Informatics
Technical University of Munich
(+49) 1626501677
dongyue.lu@tum.de
My Webpage
Github

Research Interest

3D Computer Vision, Robotic Perception, SLAM.

Education

2020–2023 (expected) **Master of Science, Robotics, Cognition, Intelligence**, *Technical University of Munich*, Munich, Germany.
GPA:1.3/1.0

2015–2020 : **Bachelor of Engineering, Vehicle Engineering**, *Tongji University*, Shanghai, China.
GPA:4.44/5.0

Publications

2023 Yingye Xin, Xingxing Zuo, Dongyue Lu, and Stefan Leutenegger. Simplemapping: Real-time visual-inertial dense mapping with deep multi-view stereo. In *22nd IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. IEEE, 2023.

Research Experience

Research Intern ***Computer Vision and Robotic Perception (CVRP) Laboratory, National University of Singapore***, July, 2022 - Present.

Topic: Dynamic Scene Reconstruction.

Advisor: Prof.Gim Hee Lee

MSc Student ***Smart Robotics Lab, Technical University of Munich***, May, 2022 - July, 2023.

Thesis: Dynamic Object SLAM with Dense Optical Flow.

Developing a joint camera and dynamic object pose estimation and shape reconstruction framework using a dense optical flow estimator and a differentiable dynamic bundle adjustment layer. (*Introduction*)

Project: SimpleMapping: Real-Time Visual-Inertial Dense Mapping with Deep Multi-View Stereo.

Proposed a real-time visual-inertial method for 3D mesh reconstruction using monocular images and IMU readings. Developed SPA-MVSNet, a neural network for leveraging sparse map points to estimate dense depth. Fused dense depth maps using TSDF-Fusion to create a global map. Achieved impressive 3D mesh reconstruction results, with a 39.7% F-score improvement over existing methods on the EuRoC dataset. (*Demo Video*)

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

MSc Student ***Visual Computing Lab, Technical University of Munich***, April, 2021 - March,2022.

Project: End-to-end Learned Multi-View Stereo Reconstruction with Transformers.

Proposed an end-to-end multi-view stereo method that fused sparse TSDF volumes incrementally regressed by 3D sparse convolution with a novel transformer fusion module to achieve coherent reconstruction. Trained and conducted experiments on ScanNet, which showed that this method had real-time efficiency and better performance in extreme cases compared to state-of-the-art methods. (*Project Page*)

Project: Shape Completion with Meso-Skeleton Learning.
Proposed a novel point cloud completion method that leveraged the intermediate meso-skeleton of a point cloud to maintain global topology. Conducted experiments on ShapeNet, which showed that using the meso-skeleton, this method could effectively capture the global structure and had a better completion effect than traditional frameworks. (*Project Page*)

Advisor:Dr.Yinyu Nie, Prof.Dr.Matthias Nießner

Selected Projects

January,2022 – March,2022 ***Path Planning for UAV Avalanche Rescue***, *Autonomous Aerial Systems group, Technical University of Munich*.
Designed and deployed a UAV equipped with an avalanche beacon in a simulated environment to perform avalanche rescue missions. Explored various path planning algorithms based on geometry and potential field for efficient victim search and compared their performance through extensive experiments. (*Project Page*)

Advisor : Christoph Killing, Prof.Dr.-Ing.Markus Ryll

June,2021 – August,2021 ***Stereo Reconstruction***, *3D AI Lab, Technical University of Munich*.
Applied various keypoint detectors (SIFT, ORB) and dense stereo matching methods (Block matching, Semi-global matching) to reconstruct 3D scenes and conducted performance comparisons. (*Project Page*)

Advisor : Yuchen Rao, Prof.Dr.Angela Dai

Fellowships & Awards

2021 ***Runner-up*** Tencent AIMIS Medical Artificial Intelligence Algorithm Competition
2020 ***2nd Prize*** "Huawei Cup" The 17th China Post-graduate Mathematical Contest in Modeling
2019 ***Champion*** Formula Student Combustion China(TJU Racing Team)
2019 ***4th Place*** Student Formula Japan(TJU Racing Team)
2018 ***4th Place*** Student Formula Japan(TJU Racing Team)
2018 ***1st Prize*** Formula Student Combustion China(TJU Racing Team)
2017 ***2nd Prize*** China Undergraduate Mathematical Contest in Modeling
2017 ***3rd Prize*** Tongji University Mathematical Contest in Modeling
2019 ***3rd Prize*** Tongji Scholarship of Excellence
2018 ***1st Prize*** Tongji Scholarship of Excellence
2017 ***3rd Prize*** Tongji Scholarship of Excellence

Working experience

June 2019 – October 2019 ***Schaeffler, Commercial Category Intern***, *Shanghai, China*.
Processed part data from suppliers with machine learning classification algorithms (k-means, random forest).

Position of Responsibility

2019-2024 **Assistant Engineer**, *China Society of Automotive Engineers*.
2017-2019 **Head of Chassis**, *TJU Racing Team*.

Skills

Computer Skills: Python, C++, Git flow, ROS, etc.

Languages: English(fluent), Chinese(native), German(basic), Japanese(basic)