

# Dongyue Lu

## Curriculum Vitae

School of Computing  
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### Research Interest

**3D Computer Vision, Robotic Perception.**

### Education

- 2020–2023: **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***, August, 2023 - Present.  
**Topic: Dexterous Hand-Object 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.**  
Developed a joint camera and dynamic object pose estimation framework using a dense optical flow estimator and a differentiable dynamic bundle adjustment layer. Solved occlusion and object discontinuity using a camera-object graph. Experiments on Virtual KITTI dataset proved this system achieved great object pose estimation accuracy and robustness in outdoor scenes. ([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. ([Project Page](#))  
**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

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## Selected Projects

January, 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 – **Stereo Reconstruction**, 3D AI Lab, Technical University of Munich.

August, 2021 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

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## 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
- 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

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## Working experience

June 2019 – **Schaeffler, Commercial Category Intern**, Shanghai, China.

October 2019 Processed part data from suppliers with machine learning classification algorithms (k-means, random forest).

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## Skills

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

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