Yun-Jin (Jim) Li

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Personal Profile

A Master's student at Technical University of Munich, studying Robotics, Cognition, Intelligence. Primarily, looking for Computer Vision / AI Engineer roles.

Education

Technical University of Munich *Munich, Germany*

M. Sc in Robotics, Cognition, Intelligence *Oct 2021 - Current*

- **Master Thesis:** 4DGSAM: Extend 3DGS into dynamic scene and combine with SAM to achieve segmentation for anything in dynamic scene novel-view synthesis.
- **Guided Research:** VXP: Voxel-Cross-Pixel Large-scale Image-LiDAR Place Recognition in **Computer Vision Group** which aims to design end-to-end neural networks to map point cloud and image data into the same shared space for more robust place recognition. This allows a more generalized approach to perform retrieval of location under various conditions. **(In review ECCV 2024)**
- **Courses:** Machine Learning, Introduction to Deep Learning, Introduction to Artificial Intelligence, Advanced Deep Learning for Robotics, Robotics, Robot Motion Planning, Computer Vision for Multi-View Geometry, Vision-Based Navigation (PR), The Evolution of Motion Estimation and Real-time 3D Reconstruction (SE)

National Tsing Hua University *Hsinchu, Taiwan*

B. Sc in Power Mechanical Engineering *Sep 2016 - June 2020*

- Vice president of the student association in our departement.
- 1 time Academic Excellence Award.

Work Experience

Infineon Technologies AG *Munich, Germany*

ML Software Development Working Student *Dec 2022 - Current*

- **Radar Material Classification** Setup radar DSP preprocessing stack and the entire ML infrastructure from data collection, annotation and loader. Design an end-to-end transformer-based neural network for radar material classification aiming to lawn mower and vacuum cleaner robot. Setup the solution for deploying/compiling our transformer-based model onto bare-metal device (PSoC6) using TFLITE/TVM framwork.
- **Technical Skills:** C/C++, Python, Pytorch, DSP, Embedded System, ML, DL, ROS, TVM, Tensorflow.

Gongin Precision Industrial Co. Ltd. *Hsinchu, Taiwan*

Junior Engineer *Sept 2020 - Jul 2021*

- **MMD-CMM Project:** Implementation of CMM geometric fitting algorithms, Development of DMIS-like-interface to set the measurement plan, Working with real-time kernel, Achieve precision within +-2um.
- **Error Model of the 5-Axis Machine Tool:** Establishment of the full error model for the 5-axis machine tool, Using least square method to calculate the compensation value, Achieve an outstanding performance that the synchronous motion BK1/BK2/BK4 are reduced to +-2um. This method is currently being used as the Standard Operation Procedure of calibration for all the 5-axis machine tools in Gongin.
- **Technical Skills:** C, C++, C#, NC code, Error model, Controller design, Git.

Projects

Visual-SLAM: Loop Closure and Relocalization ← Click Here *Munich, Germany*

Side Project *Feb 2022 - Mar 2023*

- Extend the Visual Odometry framework into Visual SLAM system.
- Implement Relocalization, Loop Closure, Pose Graph Optimization, Online Global Bundle Adjustment.
- Achieve an outstanding performance on EuRoC Vicon Room 1 and EuRoC Machine Hall dataset.

Visual-Inertial Tracking using Preintegrated Factors ← Click Here *Munich, Germany*

Technical University of Munich - Vision-Based Navigation (PR) *Dec 2022 - Jan 2023*

- Extend the Visual Odometry framework into Visual-Inertial Odometry.
- Instead of performing local bundle adjustment by minimizing the reprojection errors in the sliding window of keyframes, we compute preintegrated factor from the IMU measurement to serve as a constraint in the loss function to make the optimization more robust.

March 19, 2024

Social Navigation with Reinforcement Learning ← Click Here *Munich, Germany*

Technical University of Munich - Advanced Deep Learning for Robotics *Apr 2022 - Aug 2022*

- Come up with a GNN-inspired model named GAT4SN (Graph Attention Network for Social Navigation).
- Train the model first using imitation learning (demonstrations following ORCA policy), and then perform Deep V-Learning (Deep Value Network Learning).
- Be able to have pretty remarkable performance in very complicated environments.
- **Technical Skills:** Python, Pytorch, GNN, RL, Deep V-Learning, OpenAI Gym, PPO, DDPG, DDQN.

Jetson Nano Car ← Click Here *Munich, Germany*

Side Project *Mar 2022 - Now*

- Design the entire car chassis structure and transform the CAD file into URDF format in order to load the robot in simulation (Gazebo, Rviz).
- Complete the line follower algorithm using OpenCV library on real robot.
- **Next Steps**: Perform Sim2Real for GAT4SN on this robot, Perform visual SLAM using the RGBD camera XBox Kinect.
- **Technical Skills:** Python, ROS, C++, Rviz, Gazebo, Arduino, Motor Control, PID, OpenCV, Solidworks, CAD.

Skills

Programming	Python (PyTorch, NumPy, OpenAI Gym, etc.), C/C++ (OpenCV, OpenGV, Ceres, Eigen, Sophus, CMake), C#, Matlab.
Miscellaneous	ROS, Gazebo, Embedded System (Arduino, STM32), Motor Control (PID), Linux, Shell (Bash/Zsh), LaTeX(Overleaf/Markdown), Microsoft Office, Git, Solidworks.
Soft Skills	Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Languages

English	Professional proficiency
Mandarin	Native proficiency
German	Limited working proficiency