ZHENG-HANG (GORO) YEH

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Seeking Full Time Computer Vision/Localization & Mapping Software Engineer

EDUCATION

University of Michigan   Ann Arbor, MI, USA
· M.S. in Robotics   **GPA: 4/4**   Aug 2021 - Apr 2023
· *Courses: Deep Learning for Computer Vision, Mobile Robotics, Algorithmic Robotics, Robotics Systems Lab*

National Tsing Hua University   Hsinchu, Taiwan
· B.S. in Computer Science & Power Mechanical Engineering   Sep 2017 - Jun 2021
· **GPA: 4.13/4.3 (Graduated as Valedictorian)**
· *Courses: Parallel Programming, Distributed Systems, Mobile Robots and Self-Driving Cars, Reinforcement Learning*

SKILLS

Programming Languages: C++ / Python / Go / CUDA / MPI / Pthread / OpenMP / HTML / CSS / JavaScript
Tools: ROS / ROS2 / Pytorch / MATLAB / Linux / Git / Solidworks
Area: SLAM / Computer Vision / Machine Learning / Deep Learning / Motion Planning / Parallel Programming / Optimization

WORK EXPERIENCE

Honda Research Institute   San Jose, CA, USA
Perception and Navigation Research Engineer   Jun 2023 - now
· Achieved city-scale 3D reconstruction of the San Jose area using an optimized Structure-from-Motion algorithm.
· Reduced map size by 90% by developing a map compression algorithm based on integer linear programming.
· Architected a Geo-Spatial Hashing pipeline to enable efficient voxel map queries for real-time localization.
· Refactored and automated global route generation using the Google Maps API and A* graph search algorithm.
· Led the integration and demonstration of Multi-future MPQP speed planning across multiple racecars.
· Integrated the dynamic path planner (Frenet Envelop Planner/Frenet Corridor Planner) with ROS and performed qualitative and quantitative evaluations in CARLA and real-world racecars.

Isuzu Motor Ltd. Technical Center of America   Plymouth, MI, USA
Autonomous Driving Software Intern   Sep 2022 - Dec 2022
· Increased 5x frequency by implementing Vehicle Attractor Dynamics Approach trajectory planning algorithms in ROS2.
· Researched state-of-the-art trajectory planning, path generation and path optimization methods.

APTIV Advanced Engineering Center Advanced Safety & User Experience   Agoura Hills, CA, USA
Software Engineer Intern   May 2022 - Aug 2022
· Achieved 90% success rate of data collection by accomplishing Watchdog ROS nodes to monitor the functioning of critical components of the Radar-Based Localization project on the vehicle in real-time. (C++)
· Reduced CPU usages by 50% by setting up ROS stack on multiple machines.
· Visualized CPU usages by launching a ROS process monitor in rviz. (Python)
· Updated a sensor reader for predicting host vehicle paths to a new version protocol. (C++)
· Analyzed longitude/latitude data from GNSS/IMU sensors on google map to capture abnormal state estimation.(MATLAB)
· Debugged and fixed errors of a traffic signs sensor reader in the vision system. (C++)

Industrial Technology Research Institute (Taiwan's governmental research center)   Hsinchu, Taiwan
Robotics Research Intern   Jul 2020 - Jan 2021
· Achieved 10x acceleration in motion control by handcrafting a ROS motor driver package in C++.
· Launched the first skid-steering outdoor 4WD mobile robots with independent hub motors in Taiwan.
· Wrote a joystick teleoperation ROS package in Python for the outdoor mobile robots.
· Assisted engineers in sensor integration such as ultrasonic sensors and Lidar.

National Center for High-Performance Computing   Hsinchu, Taiwan
Machine Learning Research Intern   Aug 2019 - Dec 2019
· Reached 94% testing accuracy by data augmentation and transfer learning from VGG16 network.
· Solved 104GB image classification tasks by Convolutional Neural Networks using Python and Keras.

PROJECT EXPERIENCE

End-to-End Learning for Cross-view Vehicle Localization on Satellite Imagery Using Transformer - *Python, Pytorch* April 023
· Proposed an end-to-end learning pipeline for vehicle localization based on satellite imagery and transformers.
· Extracted Bird's Eye View features using Geometry-guided kernel transformers.
· Conducted pose optimization by a multi-level Levenberg-Marquardt optimizer.

Multi-Agent Visual SLAM - *C++, ROS*   April 2022
· Created a multi-agent Visual SLAM system with ORB SLAM2 and merge map online.
· Achieved 2x speedup compared with a single robot SLAM system

Neural Radiance Field(NeRF) for Novel View Synthesis - *Python, Pytorch*   April 2022
· Acheived 26.75 Peak Signal to Noise Ratio by Reproducing FastNeRF results. (original: 26.49)
· Reached 0.93 Structure Similarity Index Method by Reproducing FastNeRF.(original: 0.91)

RRT* Path Planning - *C++, Pthread, OpenMP, MATLAB*   Jan 2021
· Accelarted 4x faster using Pthread and OpenMP compared with sequential RRT algorithm.
· Built RRT* environment using C++ from scratch.
· Visualized the tree building process in MATLAB.