Carter **Fang**

Research Engineer · Autonomous Driving

ctyfang@gmail.com | ctyfang | carterfang | Carter Fang

Summary

Research Engineer working on perception for autonomous freight. 4+ years of R&D in Computer Vision for robotics with a focus on autonomous driving. Experience with Python, PyTorch, C++, and ROS. Interested in maximizing the societal impact of robotics.

Work Experience

Waabi *San Francisco, US*

Research Engineer *Oct. 2022 - Present (1 year)*

- Developing approaches for leveraging multiple data sources for model training with minimal catastrophic forgetting.
- Maintaining our pipeline for model training by integrating cross-team features and identifying bottlenecks.
- Supporting research projects related to Perception and Prediction such as LabelFormer accepted to CoRL 2023.

SonyAI *Zürich, Switzerland*

Perception Research Intern *Sep. 2021 - Feb. 2022 (6 months)*

- Designed a technique to calibrate a mirror-based camera system allowing for control of gaze direction.
- Trained a 2D detection network and deployed C++ inference code with TensorRT to achieve output rates of 1 kHz.
- Integrated ROS nodes for mirror control and detection into a visual servoing demo for top executives.
- Co-authored a provisional patent on a novel depth sensor (Adaptive Resolution Depth Scanning).

Motional *Singapore, Singapore*

Autonomous Vehicle Intern *Mar. 2021 - Aug. 2021 (6 months)*

- Designed a framework for efficient, safety validation in Python. Method was accepted to the IROS robotics conference in 2022.
- Maintained and implemented new software features in Python for Data Infrastructure with most significant contribution involving re-factoring a tool from the ground-up to leverage inheritance and reduce code duplication by a factor of two.
- Co-authored a provisional patent on safety validation (Search Algorithms and Safety Verification for Compliant Domain Volumes).

ETH Juniors & Franke Group *Zürich, Switzerland*

Lead Computer Vision Developer *Aug. 2020 - Aug. 2021 (1 year)*

- Deployed a multi-threaded application for cup volume estimation in C++ released as Franke's Optical Cup Recognition.
- Developed algorithms for robust model fitting, triangulation, and camera calibration to achieve a well-functioning product.

Publications and Research Projects

Data-driven Feature Tracking for Event Cameras *Zürich, Switzerland*

2023 Conference on Computer Vision and Pattern Recognition (CVPR) *Mar. 2022 - Sep. 2022 (6 months)*

- Developed a state-of-the-art feature tracking method for event cameras for my Master thesis receiving a grade of 6.0/6.0.
- Implemented project code in PyTorch available at `https://github.com/uzh-rpg/deep_ev_tracker`.
- Accepted to CVPR 2023 and selected as 1 of 12 best paper award candidates among over 900 accepted submission.

HiddenGems: Efficient safety boundary detection with active learning *Singapore, Singapore*

2022 IEEE RSJ International Conference on Intelligent Robots and Systems (IROS) *Mar. 2021 - May. 2021 (3 months)*

- Designed an efficient active-learning based safety validation algorithm to reduce simulation time by up to 6x.

Monocular Visual Odometry Pipeline *Singapore, Singapore*

Course Project with UZH Robot Perception Group *Dec. 2020 - Dec. 2020 (1 week)*

- Implemented a camera-based localization pipeline in Python, achieving a top project grade of 6.0/6.0.
- Project written in Python is available at `https://github.com/JonasFrey96/Visual-Odom-Pipeline`.

Education

ETH Zürich (Swiss Federal Institute of Technology in Zürich) *Zürich, Switzerland*

Master of Science in Robotic Systems and Control *Sep. 2019 - Oct. 2022*

- Cumulative GPA of 5.8/6.0.
- Thesis completed at Robot Perception Group led by Davide Scaramuzza.

University of British Columbia *Vancouver, Canada*

Bachelor of Applied Science in Mechanical Engineering specializing in Mechatronics *Sep. 2013 - June. 2019*

- Cumulative GPA of 4.30/4.33.