Kevin Ta

Robotics · Mechatronics · Software Developer

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Skills

Programming Python, Rust, C, C++, C#, MATLAB, ROS

Robotics computer vision, calibration, SLAM, machine learning, 3D reconstruction, dynamic programming & optimization

Mechatronics lidar, radar, event cameras, visible cameras, systems modelling, thermal modelling, mechanical design, CAD

Experience

Waabi
Toronto, Canada

Software Developer — *Jan. 2023 - Present*

- Built out classical and learned pipelines to perform extrinsic and intrinsic sensor calibration for autonomous grade perception and to evaluate functional accuracy in the field.
- Created algorithms and automation in continuous robust fleet monitoring for camera, lidar, and INS systems.

ETH Zürich Computer Vision Lab
Zürich, Switzerland

Master Thesis — *May 2022 - Nov. 2022*

- Developed methods for implicitly learning sensor-agnostic uncertainty from noisy depth maps for online neural implicit SLAM.
- Fused multiple sensor observations by learning the implicit weighting from the learned uncertainty to improve neural scene reconstruction.
- Fully calibrated a perception sensor stack featuring a state-of-the-art event-based camera, a traditional frame-based camera, a MEMS LiDAR, and a spinning RADAR to enable collection of a new autonomous driving dataset for adverse conditions.

Cruise
San Francisco, California

Sensor Calibration Intern — *Sep. 2021 - Feb. 2022*

- Developed accurate calibration and signal processing for next-gen sensors on the Cruise Origin, a purpose-built autonomous vehicle platform.
- Corrected intrinsic calibrations for visible cameras, long-wave IR cameras, and indirect time-of-flight cameras to accurately address geometric distortions and reduce projective geometry errors by a factor of 10 at vendor calibration stations.
- Researched and built software tools to analyze impact of calibration errors, developing calibration verification strategies to mitigate effects on perception by limiting errors to within one pixel space.

ETH Zürich Neural Control of Movement Lab
Zürich, Switzerland

Research Assistant — *Oct. 2020 - Jul. 2021*

- Implemented a real-time computer vision pipeline to estimate pupil size from RGB and infrared images using RANSAC-based feature extraction and ellipse fitting, achieving pupil size fits within one pixel standard deviation.

UBC Collaborative Advanced Robotics and Intelligent Systems Lab
Vancouver, Canada

Mechatronics Research Assistant — *May 2019 - Aug. 2019*

- Developed individualized ML pipelines for terrain classification and user intention detection to inform more intuitive co-control schemes using power-assisted wheelchairs, reducing user load in adverse terrain.
- Built up sensor hardware/software for TCP/IP and Bluetooth connections with Python and C++ for kinematic data streaming at 300 Hz.

Schneider Electric Solar
Burnaby, Canada

Solar Predictive Analytics and Modelling Intern — *Jan. 2018 - Aug. 2018*

- Implemented ML-based anomaly detection algorithms in Python to analyze daily data logs from globally situated utility-scale inverters in a predictive reliability model, informing effective preventative maintenance on deployed utility-scale solar inverters.

Publications

Kevin Ta*, Erik Sandström*, Luc Van Gool, and Martin R. Oswald, "UncLe-SLAM: Uncertainty Learning for Dense Neural SLAM," IEEE/CVF International Conference on Computer Vision Workshops (ICCVW), 2023.

Kevin Ta, David Brueggemann, Tim Brödermann, Christos Sakaridis, and Luc Van Gool, "L2E: Lasers to Events for 6-DoF Extrinsic Calibration of Lidars and Event Cameras," IEEE International Conference on Robotics and Automation (ICRA), 2023.

Education

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

M.Sc. in Robotics, Systems, and Control — *Sep. 2020 - Dec. 2022*

UBC (University of British Columbia)
Vancouver, Canada

B.A.Sc. in Mechanical Engineering, Mechatronics Specialization — *Sep. 2014 - May 2020*