

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

INTERMEDIATE SOFTWARE DEVELOPER

Jan. 2023 - Present

- Built out sensor extrinsic and intrinsic calibration pipelines for autonomous grade perception, evaluating functional accuracy in the field.
- Enabled end-to-end calibration of an entire sensor suite using unified neural rendering in unstructured environments.
- Investigated and automated sensor calibration quality metrics and sensor response characteristics (lidars, cameras, radars, and INS) during initial vehicle bring-up and throughout long-term operation.

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.

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