KHIEM VUONG

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https://khiemvuong.com

EDUCATION

Carnegie Mellon University, Robotics Institute *2023 - current*
Ph.D. in Robotics
Advisor: Srinivasa Narasimhan

Carnegie Mellon University, Robotics Institute *2021 - 2023*
M.S. in Robotics (thesis) GPA: 4.17/4.3
Advisor: Srinivasa Narasimhan

University of Minnesota, Twin Cities *2017 - 2021*
B.S. in Computer Science (with high distinction) GPA: 4.0/4.0
Advisors: Stergios I. Roumeliotis & Hyun Soo Park

WORK EXPERIENCE

CMU Illumination and Imaging Lab October 2021 - Present
Research Assistant - Advisor: Srinivasa Narasimhan *Pittsburgh, PA*

- Large-scale Traffic Camera Calibration: Developed a scalable framework that utilizes street-level imagery to enable precise calibration of in-the-wild traffic cameras. Publications: [C6].
- Amodal 2D/3D Object Reconstruction: Developed a novel self-supervised framework for amodal 2D/3D object reconstruction *under heavy occlusion* from long-term repetitious data. Publications: [C7].

UMN Multiple Autonomous Robotic Systems Lab September 2019 - May 2021
Research Assistant - Advisors: Stergios I. Roumeliotis and Hyun Soo Park *Minneapolis, MN*

- Robust Surface Normal Estimation: Developed a novel technique (spatial rectifier) to improve surface normal estimation for *out-of-distribution* handheld/body-mounted images. Publications: [C1], [C4].
- 3D Scene Reconstruction: Developed a robust end-to-end visual-inertial mapping system with novel dense depth and surface normal estimation modules accompanied by uncertainties estimation. Publications: [C2], [C3].
- Egocentric Scene/Object Understanding: Developed a pipeline to collect large-scale egocentric IMU-RGB-D data and build a novel egocentric 3D object dataset with estimated camera poses, scene layouts, and objects' shapes and poses. Project website: https://z.umn.edu/ideadc. Publications: [C4], [C5].

Enfusion Systems June 2019 - August 2019
Software Development Intern *Chicago, IL*

- Developed a JUnit dynamic regression testing framework for Portfolio Management System that massively increased testing coverage for trade compliance rules and position rebalancing calculator.
- Optimized a data pipeline which faciliates data transfer between local database and Google BigQuery that allows Visual Analytics System to provide real-time, instant access to on-demand portfolio analysis reports.

PUBLICATIONS (REFEREED CONFERENCE PUBLICATIONS)

[C7]. **Khiem Vuong**, N Dinesh Reddy, Robert Tamburo, and Srinivasa G. Narasimhan, "WALT3D: Generating Realistic Training Data from Time-Lapse Imagery for Reconstructing Dynamic Objects under Occlusion". IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.

[C6]. **Khiem Vuong**, Robert Tamburo, and Srinivasa G. Narasimhan, "Toward Planet-Wide Traffic Camera Calibration". IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2024.

[C5]. Under Review, "IDEO: Large Scale Egocentric 3D Object Dataset and Benchmark Challenges".

[C4]. Tien Do, **Khiem Vuong**, and Hyun Soo Park, "Egocentric Scene Understanding via Multimodal Spatial Rectifier". IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022, **[Oral]**.

[C3]. Tong Ke, Tien Do, **Khiem Vuong**, Kourosh Sartipi, and Stergios I. Roumeliotis, "Deep Multi-view Depth Estimation with Predicted Uncertainty". International Conference on Robotics and Automation (ICRA), 2021.

[C2]. Kourosh Sartipi, Tien Do, Tong Ke, **Khiem Vuong**, and Stergios I. Roumeliotis, "Deep Depth Estimation from Visual-Inertial SLAM". International Conference on Intelligent Robots and Systems (IROS), 2020.

[C1]. Tien Do, **Khiem Vuong**, Stergios I. Roumeliotis, and Hyun Soo Park, "Surface Normal Estimation of Tilted Images via Spatial Rectifier". European Conference on Computer Vision (ECCV), 2020, **[Spotlight]**.

SELECTED COURSEWORK

- Carnegie Mellon University: Computer Vision, Geometry-based Vision, Machine Learning, Convex Optimization, Robot Localization and Mapping.
- University of Minnesota: Machine Learning/Deep Learning, Linear Optimization, Computer Graphics, Linear Algebra, Data Structures and Algorithms, Operating Systems.

PROFESSIONAL ACTIVITY

Reviewer: NeurIPS 2022, CVPR 2023, ICCV 2023, WACV 2024, CVPR 2024, ECCV 2024.