

# KHIEM VUONG

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<https://khiemvuong.com>

## EDUCATION

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### Carnegie Mellon University, Robotics Institute

2023 - 2027 (*exp.*)

PhD 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

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### 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.
- 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.

### 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 facilitates 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)

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- [C6]. Under Review, "Watch and Learn Amodal 3D Reconstruction using Occlusion Categories".
- [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 Presentation**].
- [C3]. Tong Ke, Tien Do, **Khiem Vuong**, Kouros Sartipi, and Stergios I. Roumeliotis, "Deep Multi-view Depth Estimation with Predicted Uncertainty". International Conference on Robotics and Automation (ICRA), 2021.
- [C2]. Kouros 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 Presentation**].

## SELECTED COURSEWORK

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- 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

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Reviewer: NeurIPS 2022 (Datasets and Benchmarks track), CVPR 2023, ICCV 2023, WACV 2024.

## TECHNICAL SKILLS

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<b>Languages</b>	Python, Java, C/C++, MATLAB, JavaScript (elementary)
<b>Libraries</b>	PyTorch, NumPy, OpenCV, Open3D
<b>Others</b>	Git, Docker, Travis-CI, Python Flask