Patrick Rim

patrick.rim@yale.edu patrickqrim.github.io linkedin.com/in/patrickrim

Research Interests

Embodied AI with multimodal sensing {vision + language} for 3D tasks {perception + reconstruction}. Robust representations for sensor fusion {camera + lidar/radar} in challenging and dynamic settings {unsupervised + continual}.

Education

Yale University 2024 – Present
Ph.D. in Computer Science
Advisor: Prof. Alex Wong | Yale Vision Lab

Caltech 2020 – 2024
B.S. in Computer Science, Minor in Information and Data Sciences
GPA: 4.3/4.3 (Best Academic Record in Computer Science)

Industry Experience

Meta Reality Labs
Mentors: Kun He, Shoou-I Yu May 2025 – Aug 2025
— *Exciting things to come!*

Research Experience

Yale Vision Lab
Advisor: Prof. Alex Wong Aug 2024 – Present
— 3D computer vision; multimodal perception, reconstruction, and generation

MSC Lab, UC Berkeley
Advisors: Dr. Wei Zhan, Prof. Kurt Keutzer Aug 2022 – Jun 2024
— Multi-sensor 3D object detection, point-cloud segmentation and generation

Yue Lab, Caltech
Advisors: Prof. Yisong Yue, Prof. Jennifer J Sun May 2022 – Jun 2024
— Diffusion models for conditional animal trajectory generation, AI for science

Publications

"ProtoDepth: Unsupervised Continual Depth Completion with Prototypes"
P. Rim, H. Park, S. Gangopadhyay, Z. Zeng, Y. Chung, A. Wong.
Computer Vision and Pattern Recognition Conference (**CVPR**), 2025.

"SparseFusion: Fusing Multi-Modal Sparse Representations for Multi-Sensor 3D Object Detection"
Y. Xie, C. Xu, M. Rakotosaona, **P. Rim**, F. Tombari, K. Keutzer, et al.
International Conference on Computer Vision (**ICCV**), 2023.

"Quadric Representations for LiDAR Odometry, Mapping and Localization"
C. Xia, C. Xu, **P. Rim**, M. Ding, N. Zheng, K. Keutzer, M. Tomizuka, W. Zhan.
IEEE Robotics and Automation Letters (**RA-L**), 2023.

"CaltechFN: Distorted and Partially Occluded Digits"
P. Rim, S. Saha, M. Rim.
Proceedings of Asian Conference on Computer Vision (**ACCV**), 2022.

"UnCLe: Unsupervised Continual Learning of Depth Completion"
S. Gangopadhyay, X. Chen, M. Chu, **P. Rim**, H. Park, A. Wong.
arXiv Preprint, 2024.

"OcCom's Razor: Unsupervised Depth Completion by Learning from Occlusions"
H. Park, R. Chen, **P. Rim**, C. Moon, A. Wong.
In Submission, 2025.

"PriorDiffusion: Leverage Language Prior in Diffusion Models for Monocular Depth Estimation"
Z. Zeng, J. Ni, D. Wang, **P. Rim**, Y. Chung, F. Yang, B. Hong, A. Wong.
In Submission, 2025.

"ETA: Energy-based Test-time Adaptation for Depth Completion"
Y. Chung, H. Park, **P. Rim**, J. He, Z. Zeng, S. Cicek, B. Hong, A. Wong.
In Submission, 2025.

Prev. Industry Experience

Squarepoint Capital, Quantitative Research Intern — Summer 2023

- Constructed and analyzed database of price, volatility, volume, and spreads of U.S. natural gas and power futures.
- Performed market structure analysis to find predictive factors using statistical and deep learning methods.

Airstrafe Interactive, Software Engineering Intern — Spring 2023

- Designed and integrated dynamic probability models to build new AI and logic systems using C++ and Unity.
- Created inverse kinematics system using quaternions and 3D math for realistic movement and rotation.

Honors and Awards

Graduate Nathan Hale Fellowship	2024
Henry Ford II Scholar Award	2023
Jack E. Froehlich Memorial Award Nominee	2023
Marcella Bonsall SURF Fellowship	2022
George W. Housner Fund Recipient	2021, 2022
William Hassenzahl Family SURF Fellowship	2021
Hixon Prize for Writing Nominee	2021
1st Place, AI Hacks Hackathon at UPenn	2020
Top 5 Overall Hack, YHack at Yale	2020
"Best Use of Google Cloud" Award	2020
"Facebook: Building Community" Award	2020
National Merit Scholarship Recipient	2020

Teaching Experience

Head Instructor (CS 12: Computer Vision for Research) 2022 – 2023

- Independently designed and taught a term-long course that provides students with a practical and theoretical foundation in computer vision.
- Covered fundamental topics and advanced topics such as generative modeling and 3D vision, drawing from my own research.
- Taught 23 total students, including undergraduate and graduate students.[1]
- Updated course to cover diffusion models for image generation in 2024.

Head TA (First-Year Success Research Institute) Summer 2022

- Collaboratively designed a research project for FSRI (First-Year Success Research Institute) at Caltech, a DEI (Diversity, Equity, and Inclusion) program. Work included creating mini-projects and providing in-person help to students for 4-6 hours a week.
- Developed machine learning curriculum and assisted students with incorporating computer vision into their robotics projects.

Head of Online, TA (CS 2, CS 3, CS 24) 2021 – 2023

- Worked as TA for CS 2 (Data Structures), CS 3 (Software Design), and CS 24 (Computing Systems) in the fall, winter, and spring terms respectively.
- Promoted to Head of Online (Ticketing) role in 2022, where I was in charge of managing a 24/7 online help platform, in addition to holding 4-6 hours of Office Hours per week.

[1] Selected student endorsements:

- "I think you have made excellent video lectures and you are very good at explaining subjects clearly and concisely."
- "The lectures have been very comprehensive and helpful. Thanks for designing a great course!"

Service and Leadership

New England Computer Vision Workshop, Co-organizer	2024
CVPR, Reviewer	2024
NeurIPS, Reviewer	2022 – 2024
Deans Office Tutoring Program, Tutor	2022 – 2024
Quantitative Finance Club, Head of ML Research	2022 – 2024
Course Ombuds Program, Ompudsperson	2020 – 2022
Southern California Science Olympiad, Treasurer	2020 – 2021

Talks and Presentations

Unsupervised Continual Depth Completion with Prototypes — Nov 2024
The 8th New England Computer Vision (NECV) Workshop

Efficient 3D Vision — Mar 2023
Berkeley Artificial Intelligence Labs

CaltechFN: Distorted and Partially Occluded Digits — Dec 2022
Oral Presentation at ACCV 2022

Sentiment Analysis of Political Ad Videos — Oct 2022
Caltech SFP Fall Seminar Day

Identifying the Pre-Main Sequence with t-SNE — Jun 2022
Poster at 240th Meeting of the American Astronomical Society

Dimensionality Reduction to Find a New Galaxy Regime — Oct 2021
Caltech SFP Fall Seminar Day

Rethinking Galaxy Evolution with Unsupervised Learning — Aug 2021
Technical University of Denmark