

Patrick Rim

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Research Interests Building embodied AI agents with multimodal {vision + range/language} perception for 3D tasks {reconstruction + generation}. Adaptive and robust sensor fusion {camera + lidar/radar} in challenging and dynamic real-world settings {continual + unsupervised}.

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, Research Scientist Intern May 2025 – Present
Mentors: Kun He, Shou-I Yu

- Extended Reality (XR) team working on pose estimation and hand/body tracking
- Developing novel end-to-end sensing technology for in-the-wild motion capture

Squarepoint Capital, Quantitative Research Intern Jun 2023 – Sep 2023

- CTA/Commodities team analyzing volatility of U.S. natural gas and power futures
- Market structure analysis to find predictive factors using statistical and ML methods

Airstrafe Interactive, Software Engineering Intern Mar 2023 – Jun 2023

- Probabilistic decision making model for game AI agents with reasoning capabilities

Publications

“ProtoDepth: Unsupervised Continual Depth Completion with Prototypes”
P. Rim, H. Park, S. Gangopadhyay, Z. Zeng, Y. Chung, A. Wong.
IEEE/CVF Computer Vision and Pattern Recognition (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, M. Tomizuka, W. Zhan.
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 the Asian Conference on Computer Vision (**ACCV**), 2022.

“Radar-Guided Polynomial Fitting for Metric Depth Estimation”

P. Rim, H. Park, V. Ezhov, J. Moon, A. Wong.

In Submission, 2025.

“Lifelong Generation with Probabilistic Models”

P. Rim, H. Park, A. Wong.

In Submission, 2025.

“Kernelized Token Distillation of Large Vision-Language Models”

H. Park, **P. Rim**, S. Kim, A. Wong.

In Submission, 2025.

“PriorDiffusion: Leveraging Language Priors 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.

“OcCom’s Razor: Unsupervised Depth Completion by Learning from Occlusions”

H. Park, R. Chen, **P. Rim**, S. Soatto, D. Lao, A. Wong.

In Submission, 2025.

Academic Experience

Yale Vision Lab

Aug 2024 – Present

Advisor: Prof. Alex Wong

- Adaptive efficient 3D vision; multimodal perception, reconstruction, and generation

Berkeley AI Research (BAIR)

Aug 2022 – Jun 2024

Advisors: Dr. Wei Zhan, Prof. Kurt Keutzer

- Multi-sensor 3D object detection, joint point cloud segmentation and generation

Caltech, Vision and Learning

May 2022 – Jun 2024

Advisors: Prof. Yisong Yue, Prof. Jennifer J. Sun

- Diffusion models for conditional animal trajectory generation, Interpretable AI

Honors & 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
	<ul style="list-style-type: none"> – 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
	<ul style="list-style-type: none"> – 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 TA – Online (CS 2, CS 3, CS 24)	2021 – 2023
	<ul style="list-style-type: none"> – 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 TA of Online Platform role in 2022, where I was in charge of managing a 24/7 online Q&A-style teaching platform, in addition to holding 4-6 hours of Office Hours per week. 	
Leadership & Service	New England Computer Vision Workshop , Co-organizer	Nov 2024
	CVPR, ICCV, NeurIPS , Reviewer	2022 – Present

¹Selected 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!”

	Quantitative Finance Club , Head of ML Research	2022 – 2024
	Deans Office Tutoring Program , Tutor	2022 – 2024
	Course Ombuds Program , Ompudsperson	2020 – 2022
	Southern California Science Olympiad , Treasurer	2020 – 2021
Invited Talks & Seminars	2D to 3D Generation — What’s Next? Yale Computer Science x Biomedical Engineering	Mar 2025 – May 2025
	Adaptive, Efficient, and Robust 3D Vision NYC Computer Vision Day 2025	Jan 2025
	Unsupervised Continual Depth Completion with Prototypes The 8th New England Computer Vision (NECV) Workshop	Nov 2024
	Efficient 3D Perception Berkeley Artificial Intelligence Labs	Mar 2023
	CaltechFN: Distorted and Partially Occluded Digits Oral Presentation at ACCV 2022	Dec 2022
	Sentiment Analysis of Political Ad Videos Caltech SFP Fall Seminar	Oct 2022
	Identifying the Pre-Main Sequence with t-SNE Poster at 240th Meeting of the American Astronomical Society	Jun 2022
	Dimensionality Reduction to Find a New Galaxy Regime Caltech SFP Fall Seminar	Oct 2021
	Rethinking Galaxy Evolution with Unsupervised Learning Technical University of Denmark	Aug 2021