

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 <i>Ph.D. in Computer Science</i> Advisor: Prof. Alex Wong Yale Vision Lab	2024 – Present
	Caltech <i>B.S. in Computer Science, Minor in Information and Data Sciences</i> GPA: 4.3/4.3 (Best Academic Record in Computer Science)	2020 – 2024
Industry Experience	Meta Reality Labs , Research Scientist Intern Mentors: Kun He, Shou-I Yu <ul style="list-style-type: none">– Extended Reality (XR), working on ego-exo 3D hand-object (6DoF) pose estimation– Developing novel end-to-end perception pipeline for in-the-wild ground truth collection with a mobile multi-camera rig; preparing a large-scale hand-object tracking dataset and its applications to robotics and teleoperation for submission to CVPR 2026	May 2025 – Present
	Squarepoint Capital , Quantitative Research Intern <ul style="list-style-type: none">– Market structure analysis to find predictive factors using statistical and ML methods	Jun 2023 – Sep 2023
	Airstrafe Interactive , Software Engineering Intern <ul style="list-style-type: none">– Probabilistic decision making model for game AI agents with reasoning capabilities	Mar 2023 – Jun 2023
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.	
	“ETA: Energy-based Test-time Adaptation for Depth Completion” Y. Chung*, H. Park*, P. Rim *, X. Zhang, J. He, Z. Zeng, S. Cicek, B. Hong, et al. (*equal contribution) International Conference on Computer Vision (ICCV), 2025.	
	“Extending Foundational Monocular Depth Estimators to Fisheye Cameras with Calibration Tokens” S. Gangopadhyay*, J. Kim*, X. Chen*, P. Rim , H. Park, A. Wong. International Conference on Computer Vision (ICCV), 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.

“ODE-GS: Latent ODEs for Dynamic Scene Extrapolation with 3D Gaussian Splatting”

D. Wang, **P. Rim**, T. Tian, A. Wong, G. Sundaramoorthi.

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 MDE”

Z. Zeng, J. Ni, D. Wang, **P. Rim**, Y. Chung, F. Yang, B. Hong, 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	Yale Computer Science “Rising Star” Award Graduate Nathan Hale Fellowship Henry Ford II Scholar Award Jack E. Froehlich Memorial Award Nominee Marcella Bonsall SURF Fellowship George W. Housner Fund Recipient William Hassenzahl Family SURF Fellowship Hixon Prize for Writing Nominee 1st Place, AI Hacks Hackathon at UPenn Top 5 Overall Hack, YHack at Yale “Best Use of Google Cloud” Award “Facebook: Building Community” Award National Merit Scholarship Recipient	2025 2024 2023 2023 2022 2021, 2022 2021 2021 2020 2020 2020 2020 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 transformers, diffusion models, and geometric 3D vision, drawing from my own research. – Taught 23 total students, including undergraduate and graduate students.¹ 	
	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 for all three courses 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 CVPR, ICCV, NeurIPS, ICLR , Reviewer	Nov 2024 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!”

	IEEE Transactions on Image Processing (TIP) , Reviewer	2025 – Present
	Quantitative Finance at Caltech , Head of ML Research	2022 – 2024
	Caltech Deans Office , Peer Academic Coach	2022 – 2024
	Caltech Course Ombuds Program , Ompudsperson	2020 – 2022
	Southern California Science Olympiad , Treasurer	2020 – 2021
Invited Talks & Seminars	Adapting 3D Reconstruction Models on the Fly, From Test-Time Adaptation to Continual Learning	Sep 2025
	NSF AI Institute for Edge Computing (Athena) Seminar Series	
	2D to 3D Generation – What's Next?	Mar 2025 – May 2025
	Yale Computer Science x Biomedical Engineering	
	Adaptive, Efficient, and Robust 3D Vision	Jan 2025
	NYC Computer Vision Day 2025	
	Unsupervised Continual Depth Completion with Prototypes	Nov 2024
	The 8th New England Computer Vision (NECV) Workshop	
	Efficient 3D Perception	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	
	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	
	Rethinking Galaxy Evolution with Unsupervised ML	Aug 2021
	Technical University of Denmark	