

# 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, Shoou-I Yu

- 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

**Squarepoint Capital**, Quantitative Research Intern Jun 2023 – Sep 2023

- 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.

“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	2025
	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	<b>Head Instructor (CS 12: Computer Vision for Research)</b>	2022 – 2023
	<ul style="list-style-type: none"> <li>– Independently designed and taught a term-long course that provides students with a practical and theoretical foundation in computer vision.</li> <li>– Covered fundamental topics and advanced topics such as transformers, diffusion models, and geometric 3D vision, drawing from my own research.</li> <li>– Taught 23 total students, including undergraduate and graduate students.<sup>1</sup></li> </ul>	
	<b>Head TA (First-Year Success Research Institute)</b>	Summer 2022
	<ul style="list-style-type: none"> <li>– 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.</li> <li>– Developed machine learning curriculum and assisted students with incorporating computer vision into their robotics projects.</li> </ul>	
	<b>Head TA – Online (CS 2, CS 3, CS 24)</b>	2021 – 2023
	<ul style="list-style-type: none"> <li>– 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.</li> <li>– 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&amp;A-style teaching platform, in addition to holding 4-6 hours of Office Hours per week.</li> </ul>	
Leadership & Service	<b>New England Computer Vision Workshop</b> , Co-organizer	Nov 2024
	<b>CVPR, ICCV, NeurIPS, ICLR</b> , Reviewer	2022 – Present

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<sup>1</sup>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!”

	<b>IEEE Transactions on Image Processing (TIP), Reviewer</b>	2025 – Present
	<b>Quantitative Finance at Caltech, Head of ML Research</b>	2022 – 2024
	<b>Caltech Deans Office, Peer Academic Coach</b>	2022 – 2024
	<b>Caltech Course Ombuds Program, Ompudsperson</b>	2020 – 2022
	<b>Southern California Science Olympiad, Treasurer</b>	2020 – 2021
<b>Invited Talks &amp; Seminars</b>	<b>Adapting 3D Reconstruction Models on the Fly, From Test-Time Adaptation to Continual Learning</b>	Sep 2025
	NSF AI Institute for Edge Computing (Athena) Seminar Series	
	<b>2D to 3D Generation – What’s Next?</b>	Mar 2025 – May 2025
	Yale Computer Science x Biomedical Engineering	
	<b>Adaptive, Efficient, and Robust 3D Vision</b>	Jan 2025
	NYC Computer Vision Day 2025	
	<b>Unsupervised Continual Depth Completion with Prototypes</b>	Nov 2024
	The 8th New England Computer Vision (NECV) Workshop	
	<b>Efficient 3D Perception</b>	Mar 2023
	Berkeley Artificial Intelligence Labs	
	<b>CaltechFN: Distorted and Partially Occluded Digits</b>	Dec 2022
	Oral Presentation at ACCV 2022	
	<b>Sentiment Analysis of Political Ad Videos</b>	Oct 2022
	Caltech SFP Fall Seminar	
	<b>Identifying the Pre-Main Sequence with t-SNE</b>	Jun 2022
	Poster at 240th Meeting of the American Astronomical Society	
	<b>Dimensionality Reduction to Find a New Galaxy Regime</b>	Oct 2021
	Caltech SFP Fall Seminar	
	<b>Rethinking Galaxy Evolution with Unsupervised ML</b>	Aug 2021
	Technical University of Denmark	