

# Akshay Paruchuri

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## Summary

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My research interests are at the intersection of computer vision, machine learning, and natural language processing. Currently, I'm working toward a future where next-generation healthcare systems improve the entire patient journey, from advanced diagnostic imaging and surgical support to all-day health monitoring and management, to achieve better therapeutic outcomes for cancer and aging-related diseases. I've published in leading venues on topics such as remote health sensing (WACV, NeurIPS), 3D reconstruction (ECCV, MICCAI), LLM-based conversational agents for personal health (EMNLP, Nature Communications), and energy-efficient operation of smart glasses (ISMAR). I'm generally interested in opportunities that would allow me to continue to strengthen my research interests while leading and working on projects with meaningful, positive real-world impact, especially with respect to areas such as healthcare and environmental sustainability.

## Education

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### University of North Carolina at Chapel Hill

PH.D. IN COMPUTER SCIENCE

- Research Areas: Computer Vision, Machine Learning, and Natural Language Processing
- Advisor: Henry Fuchs

Chapel Hill, NC, USA

Aug 2021 - Dec 2025

### North Carolina State University

B.S. IN ELECTRICAL AND COMPUTER ENGINEERING

Raleigh, NC, USA

Aug 2014 - Dec 2019

## Experience

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### Stanford University

POSTDOCTORAL SCHOLAR (ADVISOR: EHSAN ADELI)

- Building next-generation healthcare systems to improve therapeutic outcomes for cancer and aging-related diseases.

Palo Alto, CA, USA

Feb 2026 - Present

### Istituto Dalle Molle di Studi sull'Intelligenza Artificiale (IDSIA)

VISITING RESEARCHER (ADVISOR: PIOTR DIDYK)

- Research involving computer vision and human perception, with a focus on multi-modal language models (MLMs) as both general and egocentric assistants.

Lugano, Ticino, CH

Jun 2025 - Jan 2026

### Google

STUDENT RESEARCHER (ADVISOR: ISHAN CHATTERJEE)

- Research involving context-aware, multimodal systems, with a focus on realizing AR smart glasses for all-day use.

Seattle, WA, USA

Feb 2025 - Jan 2026

### University of North Carolina at Chapel Hill

GRADUATE RESEARCH ASSISTANT (ADVISOR: HENRY FUCHS)

- Research at the intersection of computer vision, machine learning, and natural language processing.

Chapel Hill, NC, USA

Aug 2021 - Dec 2025

### Google

STUDENT RESEARCHER (ADVISORS: XIN LIU AND DANIEL McDUFF)

- Research at the intersection of healthcare and language models.

Seattle, WA, USA

Mar 2024 - Aug 2024

### Kitware

RESEARCH AND DEVELOPMENT INTERN (ADVISOR: BRIAN CLIPP)

- Various research projects involving person re-identification, object detection, segmentation, and tracking.

Carrollboro, NC, USA

Apr 2023 - Jul 2023

### Nike

EMBEDDED SYSTEMS ENGINEER (MANAGER: VIKRAM MALHOTRA)

- Developed hardware, algorithms, and software toward novel, wearable consumer devices for experiences involving physical fitness.

Beaverton, OR, USA

Jan 2020 - Jul 2021

## Nike

EMBEDDED SYSTEMS ENGINEERING INTERN (MANAGER: VIKRAM MALHOTRA)

- Prototyped a feature-rich, non-form factor PCB to characterize power consumption in unique contexts and developed software toward meaningful gesture recognition using adaptive, self-lacing shoes.

Beaverton, OR, USA

May 2019 - Aug 2019

## Publications

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- 13** Tianwen Zhou, **Akshay Paruchuri**, Josef Spjut, Kaan Akşit. Editing Physiological Signals in Videos Using Latent Representations. *arXiv preprint:2509.25348*, 2025. In submission.
- 12** A. Ali Heydari\*, Ken Gu\*, Vidya Srinivas\*, Hong Yu\*, Zhihan Zhang, Yuwei Zhang, **Akshay Paruchuri**, Qian He, Hamid Palangi, Nova Hammerquist, Ahmed A. Metwally, Brent Winslow, Yubin Kim, Kumar Ayush, Yuzhe Yang, Girish Narayanswamy, Maxwell A. Xu, Jake Garrison, Amy Aremnto Lee, Jenny Vafeiadou, Ben Graef, Isaac R. Galatzer-Levy, Erik Schenck, Andrew Barakat, Javier Perez, Jacqueline Shreibati, John Hernandez, Anthony Z. Faranesh, Javier L. Prieto, Connor Heneghan, Yun Liu, Jiening Zhan, Mark Malhotra, Shwetak Patel, Tim Althoff, Xin Liu†, Daniel McDuff†, and Xuhai "Orson" Xu†. The Anatomy of a Personal Health Agent. *arXiv preprint arXiv:2508.20148*, 2025. In submission.
- 11** **Akshay Paruchuri**, Maryam Aziz, Rohit Vartak, Ayman Ali, Best Uchehara, Xin Liu, Ishan Chatterjee, Monica Agrawal. "What's Up, Doc?": Analyzing How Users Seek Health Information in Large-Scale Conversational AI Datasets. *arXiv preprint arXiv:2506.21532*, 2025. Accepted to EMNLP 2025 (Findings).
- 10** Ken Gu, Zhihan Zhang, Kate Lin, Yuwei Zhang, **Akshay Paruchuri**, Hong Yu, Mehran Kazemi, Kumar Ayush, A. Ali Heydari, Maxwell A. Xu, Yun Liu, Ming-Zher Poh, Yuzhe Yang, Mark Malhotra, Shwetak Patel, Hamid Palangi, Xuhai Xu, Daniel McDuff, Tim Althoff, Xin Liu. RADAR: Benchmarking Language Models on Imperfect Tabular Data. *arXiv preprint arXiv:2506.08249*, 2025. Accepted to NeurIPS 2025 Datasets and Benchmarks Track.
- 9** **Akshay Paruchuri**, Sinan Hersek, Lavisha Aggarwal, Qiao Yang, Xin Liu, Achin Kulshrestha, Andrea Colaço, Henry Fuchs, and Ishan Chatterjee. EgoTrigger: Toward Audio-Driven Image Capture for Human Memory Enhancement in All-Day Energy-Efficient Smart Glasses. *arXiv preprint arXiv:2508.01915*, 2025. Accepted to ISMAR 2025. **[TVCG Journal Paper, Top 8%, 60 of 762 submissions]**
- 8** **Akshay Paruchuri**, Jake Garrison, Shun Liao, John Hernandez, Jacob Sunshine, Tim Althoff, Xin Liu, and Daniel McDuff. What Are the Odds? Language Models Are Capable of Probabilistic Reasoning. In *Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing* (pp. 11712-11733), November 2024.
- 7** **Akshay Paruchuri**\*, Mike A. Merrill\*, Naghmeh Rezaei, Geza Kovacs, Javier Perez, Yun Liu, Erik Schenck, Nova Hammerquist, Jake Sunshine, Shyam Tailor, Kumar Ayush, Hao-Wei Su, Qian He, Cory McLean, Mark Malhotra, Shwetak Patel, Jiening Zhan, Tim Althoff†, Daniel McDuff†, and Xin Liu†. Transforming Wearable Data into Health Insights using Large Language Model Agents. *arXiv preprint arXiv:2406.06464*, 2024. Accepted to Nature Communications.
- 6** Shuxian Wang, **Akshay Paruchuri**, Zhaoxi Zhang, Sarah McGill, Roni Sengupta. Structure-Preserving Image Translation for Depth Estimation in Colonoscopy. In *International Conference on Medical Image Computing and Computer-Assisted Intervention* (pp. 667-677). Cham: Springer Nature Switzerland, October 2024. **[Oral]**
- 5** **Akshay Paruchuri**, Samuel Ehrenstein, Shuxian Wang, Inbar Fried, Stephen M. Pizer, Marc Niethammer, and Roni Sengupta. (2024). Leveraging Near-Field Lighting for Monocular Depth Estimation from Endoscopy Videos. In *European Conference on Computer Vision* (pp. 473-491). Springer, Cham.
- 4** Xin Liu, **Akshay Paruchuri**\*, Girish Narayanswamy\*, Xiaoyu Zhang, Jiankai Tang, Yuzhe Zhang, Roni Sengupta, Shwetak Patel, Yuntao Wang, and Daniel McDuff. rPPG-Toolbox: Deep Remote PPG Toolbox. *Advances in Neural Information Processing Systems*, vol. 36, 2024. **[700 stars on GitHub as of July, 2025]**
- 3** **Akshay Paruchuri**, Xin Liu, Yulu Pan, Shwetak Patel, Daniel McDuff, and Soumyadip Sengupta. Motion Matters: Neural Motion Transfer for Better Camera Physiological Measurement. *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, January 2024, pp. 5933-5942. **[Oral, Top 2.6%, 53 of 2042 submissions]**

- 2** Qian Zhang, **Akshay Paruchuri**, Young-Woon Cha, Jia-Bin Huang, Jade Kandel, Howard Jiang, Adrian Ilie, Andrei State, Danielle Szafir, Daniel Szafir, and Henry Fuchs. Reconstruction of Human Body Pose and Appearance Using Body-Worn IMUs and a Nearby Camera View for Collaborative Egocentric Telepresence. *2023 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, Shanghai, China, 2023, pp. 96-97, doi: 10.1109/VRW58643.2023.00025.
- 1** Angelos Angelopoulos, Austin Hale, Husam Shaik, **Akshay Paruchuri**, Ken Liu, Randal Tuggle, and Daniel Szafir. Drone Brush: Mixed Reality Drone Path Planning. *Late-Breaking Reports at the IEEE/ACM International Conference on Human-Robot Interaction (HRI 2022)*.

## Teaching

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### UNC CHAPEL HILL

2D Computer Graphics (Fall 2024, Teaching Assistant)

## Mentoring

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Mingxuan Li (UNC CS BS, Spring 2022, now at CMU CS BS)  
Yulu Pan (UNC CS BS, Fall 2022-Spring 2023, now at UNC CS PhD)  
Ray Shealy (UNC CS BS, Fall 2024-Fall 2025)  
Tianwen Zhou (UCL CS MS, Summer 2025-Fall 2025)

## Presentations

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### Toward All-Day Ambient and Wearable Intelligence for Healthcare

Research Talk, Stanford Translation AI (STA) Lab, Remote (Summer 2025)  
Seminar, NYU Immersive Computing Lab, Remote (Fall 2025)  
Seminar, UCL Computational Light Laboratory, Remote (Fall 2025)

### Your life's co-pilot. In your glasses.

Research Talk, NVIDIA Research, Durham, NC (Summer 2025)

### Motion Matters: Neural Motion Transfer for Better Camera Physiological Sensing

Poster Presentation, International Conference on Computational Photography (Summer 2023)  
Poster Presentation, UNC Data Science Day (Fall 2023)  
Oral + Poster Presentation, IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) (Winter 2024)

## Proposals

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**NIH SCH: An Augmented Reality Neurorehabilitation System for Monitoring and Management of Motor Symptoms of Parkinson's Disease.** Project Number: 1R01HD111074 (\$1,186,393 across 4 years). Role: Student lead. I wrote significant portions of the proposal under the supervision of Professor Henry Fuchs and I helped in literally every aspect of the proposal submission process.

## Outreach & Academic Service

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### Outreach

UNC-CH Computer Science Student Association Officer, Summer 2023 - Spring 2024  
UNC-CH Computer Science Student Association President, Fall 2022 - Summer 2023  
UNC CS Fellowship Panel Organizer, Fall 2022  
Decoding Graduate Programs in CS Panel Member, Fall 2022  
UNC CS Middle School/High School Open House Volunteer, Spring 2023  
UNC CS Vision Seminar Organizer, Spring 2023  
Summer Geometry Initiative (SGI) Mentor, Summer 2024

### Academic Service

IEEE VR 2023, Reviewer  
Information Systems Frontiers, Reviewer  
NeurIPS 2024 Datasets and Benchmarks, Reviewer  
CSCW 2025, Reviewer  
CHI 2025, Reviewer  
CVPR 2025 - Workshop on Computer Vision for Mixed Reality, Reviewer  
ISMAR 2025, Reviewer  
UIST 2025, Reviewer  
ML4H 2025, Reviewer