

Akshay Paruchuri

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Summary

My research interests are at the intersection of computer vision, computer graphics, and machine learning. I work on research that typically involves applications in healthcare and/or augmented reality. Currently, I'm working toward a future where wearable, spatial computing devices, such as augmented reality eyeglasses capable of all-day use, are contextually aware and personalized to the benefit of users and their goals (e.g., human memory enhancement, becoming healthier). Prior to my current interests, I've worked on synthetic data generation pipelines for health sensing, 3D reconstruction from endoscopy videos, and health insights agents that leverage large language models.

Education

University of North Carolina at Chapel Hill

PH.D. IN COMPUTER SCIENCE

Chapel Hill, NC, USA

Aug 2021 - Dec 2025 (Expected)

- Research Areas: Computer Vision, Computer Graphics, and Machine Learning
- Advisor: Henry Fuchs

North Carolina State University

B.S. IN ELECTRICAL AND COMPUTER ENGINEERING

Raleigh, NC, USA

Aug 2014 - Dec 2019

- Graduated with Honors
- Research Areas: Embedded Systems, Wearable Sensors

Experience

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

VISITING RESEARCHER (ADVISOR: PIOTR DIDYK)

Lugano, CH

Jun 2025 - Present

- Research involving computer vision, graphics, and human perception, with a focus on realizing AR smart glasses for all-day use and vision-language models (VLMs).

Google

STUDENT RESEARCHER (ADVISORS: ISHAN CHATTERJEE)

Seattle, WA

Feb 2025 - Present

- Research involving adaptive camera sensor capture and context-aware systems, with a focus on realizing AR smart glasses for all-day use.

Google

STUDENT RESEARCHER (ADVISORS: XIN LIU AND DANIEL McDUFF)

Seattle, WA

Mar 2024 - Aug 2024

- Research at the intersection of healthcare and language models.

Kitware

RESEARCH AND DEVELOPMENT INTERN (ADVISOR: BRIAN CLIPP)

Carrboro, NC

Apr 2023 - Jul 2023

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

University of North Carolina at Chapel Hill

GRADUATE RESEARCH ASSISTANT (ADVISOR: HENRY FUCHS)

Chapel Hill, NC

Aug 2021 - Present

- Research at the intersection of computer vision, computer graphics, and machine learning.

Nike

EMBEDDED SYSTEMS ENGINEER (MANAGER: VIKRAM MALHOTRA)

Beaverton, OR

Jan 2020 - Jul 2021

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

Nike

EMBEDDED SYSTEMS ENGINEERING INTERN (MANAGER: VIKRAM MALHOTRA)

Beaverton, OR

May 2019 - Aug 2019

- 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.

Publications

- 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. In submission.
- 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 Szafer, Daniel Szafer, 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 Szafer. Drone Brush: Mixed Reality Drone Path Planning. *Late-Breaking Reports at the IEEE/ACM International Conference on Human-Robot Interaction (HRI 2022)*.

Skills

Design	Research Experiments, User interface design, Hardware prototypes (PCB layout, circuit modeling)
Programming	C++, C, Python (NumPy, OpenCV, TensorFlow, JAX, PyTorch, and PyTorch3D)
Hardware	Displays, MCUs, FPGAs, Soldering, Oscilloscope, Logic analyzer, 3D printing

Courses

TAKEN

First Principles of Computer Vision (Coursera), Mathematics for Machine Learning and Data Science (Coursera), Computer Vision in our 3D World (UNC), Machine Learning (UNC), Deep Learning (UNC), Neural Rendering (UNC), Visual Recognition with Transformers (UNC), Topics in Parallel Computing (UNC), Mobile Health Systems (UNC), Human-Robot Interaction (UNC), Information Visualization (UNC), and Introduction to Mathematical Thinking (Coursera)

TAUGHT

2D Computer Graphics (Fall 2024, TA)

Awards

ASSIST Center Undergraduate REU (Summer 2018, sponsored by RTNN)
ASSIST Center Undergraduate Research Fellowship (Fall 2018)
NC State ECE Department Undergraduate REU (Fall 2018)
NC State Dean's List (4.0 GPA in Spring 2019 and Fall 2019)

Presentations

Toward All-Day Ambient and Wearable Intelligence for Healthcare

Research Talk, Stanford Translation AI (STAI) 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

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.

Mentoring

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-Present)
Ashley Neall (UNC CS BS, Spring 2024-Present)

Outreach & Academic Service

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

Authorizations

U.S. Citizenship

Amateur Radio License (Granted by the FCC, Call-sign: KN4IOS)

Hobbies

Reading, running, hiking