Prasanth Sasikumar

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720 citations · h-index 12 · i10-index 15 · 30+ publications · CHI · IEEE VR · ISMAR · SIGGRAPH Asia

Summary

XR and HCI researcher (PhD, 2024) with a publication record at CHI, ISMAR, IEEE VR, and SIGGRAPH Asia spanning multimodal and human-AI interaction, physiological computing, and real-time 3D reconstruction and computer vision. Comfortable across the full arc of a research or product problem: co-design with domain stakeholders, prototype development, sensor and ML pipeline engineering, and controlled or field studies that measure real-world effects. Experience ranges from wearable and smart-glasses interfaces and adaptive AR/VR systems to multi-camera volumetric capture and multimodal deep learning, plus curriculum design and classroom teaching. Currently founder of FlowsXR, building an AI assistant delivered through smart glasses for field technicians.

Research & Professional Experience

- **FlowsXR** — Remote / Boston, MA
  Founder — *March 2026 – Present*
  - **Sidekick (`sidekick.flowsxr.com`)**: Founder of FlowsXR. Building Sidekick, an AI assistant that delivers real-time procedural guidance to field technicians through smart glasses, escalating to a human expert when model confidence drops. Running full-time customer discovery across US trades to validate the human-AI-expert teaming model.

- **National University of Singapore** — Singapore
  Research Fellow — *April 2023 – Present*
  - **Adaptive AR Interfaces Driven by Cognitive and Physical Load**: Developed AR collaboration interfaces that adapt in real time to a user's cognitive and physical load, inferred from physiological and behavioral signals (CHI 2025).
  - **Co-Design and Field Evaluation of an MR Wellbeing Tool**: Co-designed a mixed-reality stress-intervention app with mental health experts (ISMAR 2025), then built Zenflow, the resulting MR system using gradual real-to-virtual environmental transitions for pranayama-based relaxation; a 3-week field study (N=12) showed significant improvements in sleep quality and stress (CHI 2026).
  - **Physiological Sensing in Collaborative VR**: Ran a user study showing that sharing physiological cues improves collaboration in VR assembly tasks (IEEE VR 2024).
  - **VR Motion Sickness Dataset and Prediction Models**: Partnered with Meta to build a large-scale VR motion sickness dataset and machine learning models predicting onset from interaction and environment parameters; awarded Best Paper at IEEE VR 2024 (IEEE TVCG 2024, 54 citations).
  - **Real-Time AR Captioning for Accessibility**: Built and evaluated real-time AR caption interfaces for deaf and hard-of-hearing students in specialized classrooms (CHI 2024).

- **University of Auckland** — Auckland, NZ
  PhD Researcher, Bioengineering — *2019 – 2024*
  - **Multi-User MR Remote Collaboration with Gaze and Gesture Sharing**: Designed and ran a user study on mixed-reality remote collaboration combining shared eye gaze and hand gestures, now one of the most-cited works on the technique (276 citations, CHI 2020).
  - **Real-Time Multi-Camera 3D Reconstruction**: Built Wearable RemoteFusion, a real-time multi-depth-camera pipeline fusing point-cloud data from four RGB-D sensors into a live dense 3D scene reconstruction for mixed-reality remote collaboration (ISMAR 2019).
  - **Volumetric Capture for AR Training Playback**: Designed a multi-camera volumetric capture system (three calibrated Azure Kinects) with a custom C++ point-cloud stitching pipeline, reconstructing full-body volumetric video for augmented-reality training playback (Frontiers in Virtual Reality 2021).
  - **EEG and Eye Gaze Sensing in Collaborative VR**: Studied inter-brain synchrony and eye gaze direction during collaboration in VR (CHI 2022).

- **University of Auckland** — Auckland, NZ
  Research Assistant — *2020 – 2022*
  - **Applied AR Prototyping for Industry Partners**: Built an AR breast bio-imaging overlay for evaluation with the biomimetics research group, and a Magic Leap-based interactive showroom prototype for Mercedes-Benz with configurable vehicle customization.

- **Massey University** — Auckland, NZ
  Research Assistant — *2021 – 2022*
  - **AR Prototype for Safety Training**: Developed a HoloLens 2 AR application for building fire-safety training and ran a comparative study against traditional methods (Automation in Construction 2024).

- **University of Auckland** — Auckland, NZ
  Graduate Teaching Assistant, School of Design & XR Technologies — *2020 – 2022*

- **Curriculum Design and Classroom Teaching**: Co-designed and taught *Designing Mixed Realities*, an undergraduate course on MR/Unity design, alongside *Design Methods and Processes* and *Design Theory and Fundamentals*; built course materials, assignments, and evaluation matrices, and delivered weekly classroom instruction across multiple semesters.
- **XR Development Tutorials and Hackathon Mentorship**: Conducted technical tutorials and hands-on workshops on XR development tools and platforms (Unity, Unreal Engine, Meta Spark Studio, Mozilla Hubs), and mentored students in XR hackathons.

Selected Publications

- **CHI '20 (full): A User Study on MR Remote Collaboration with Eye Gaze and Hand Gesture Sharing (276 citations)**: doi.org/10.1145/3313831.3376550 2020
- **JMUI '20: The Effects of Spatial Auditory and Visual Cues on MR Remote Collaboration (92 citations)**: doi.org/10.1007/s12193-020-00331-1 2020
- **IEEE TVCG '24: VR.net – A Real-world Dataset for VR Motion Sickness Research (54 citations, Best Paper Award, IEEE VR 2024)**: doi.org/10.1109/TVCG.2024.3372044 2024
- **Automation in Construction '24: Optical See-Through AR Fire Safety Training for Building Occupants (45 citations)**: doi.org/10.1016/j.autcon.2024.105371 2024
- **ISMAR '19: Wearable RemoteFusion – MR Collaboration with Gaze and Gesture Sharing (44 citations)**: doi.org/10.1109/ISMAR-Adjunct.2019.000-3 2019
- **CHI EA '22: Inter-Brain Synchrony and Eye Gaze Direction During Collaboration in VR (22 citations)**: doi.org/10.1145/3491101.3519746 2022
- **Frontiers in VR '21: Spatial Perception Enhancement in Assembly Training Using Augmented Volumetric Playback (20 citations)**: doi.org/10.3389/frvir.2021.694794 2021
- **IEEE VR '24: A User Study on Sharing Physiological Cues in VR Assembly Tasks (17 citations)**: doi.org/10.1109/VR58804.2024.00096 2024
- **CHI '25 (full): Who is in Control? Understanding User Agency in AR-Assisted Construction Assembly (12 citations)**: doi.org/10.1145/3706598.3713765 2025
- **CHI EA '24: SeEar – Tailoring Real-time AR Caption Interfaces for DHH Students (9 citations)**: doi.org/10.1145/3613905.3650974 2024
- **ISMAR '25: Co-Designing Stress Interventions in Mixed Reality with Mental Health Experts**: doi.org/10.1109/ISMAR-Adjunct68609.2025.00030 2025
- **CHI '26 (full): Zenflow – Investigating MR Transitions for Enhancing Sleep and Relaxation**: doi.org/10.1145/3772318.3791875 2026

Education

- **University of Auckland** — Auckland, NZ
  PhD in Bioengineering — *2019 – 2024*
- **University of Canterbury** — Christchurch, NZ
  Masters in Human Interface Technology — *2017 – 2018*
- **University of Kerala** — Trivandrum, India
  Bachelor of Computer Science Engineering — *2010 – 2014*

Skills

- **Research Methods**: Co-design and participatory design with domain stakeholders, controlled user study design, qualitative and quantitative methods, mixed methods, statistical analysis, usability testing.
- **XR Prototyping**: Unity, Unreal Engine; OpenXR, ARKit; HoloLens 1/2, Magic Leap 1/2, Meta Quest/Pro, Apple Vision Pro, Valve Index, Galea.
- **Sensing, Signals & 3D Reconstruction**: Tobii and SMI eye tracking; pupillometry; EEG (OpenBCI, Galea), ECG, GSR, HRV, EMG, PPG; Shimmer3, Empatica E4; multi-sensor point-cloud fusion, camera calibration, volumetric capture, real-time 3D scene reconstruction, multi-camera skeletal tracking (Azure Kinect, RealSense).
- **Machine Learning & Programming**: Python (PyTorch, scikit-learn, SciPy, NumPy), MATLAB, C++; transformer models, statistical signal processing, time-series analysis, ML model training and evaluation.

Awards, Grants & Service

- MBIE Grant for Masters (2017–2018) and TEC Grant (NZ Govt) for PhD (2019–2024).
- Invited to Meta Aria Research Kit Summit 2025 (smart glasses research platform); invited participant, Meta XR Hackathons: Menlo Park 2023 and Istanbul 2024. Runner-up, MYOB IT Challenge 2017: mobile AR inventory management application.
- **Student Volunteer Chair** — Christchurch / Shanghai / Seattle
  IEEE VR SV Chair (2022, 2023) · ISMAR SV Chair (2024) — *2022 – 2024*