Talha Khan

Assistant Professor
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https://talhakhan13.github.io/ Google Scholar

Research Overview

My research lies in the general area of **Human-Computer Interaction** (HCI). I design **mixed reality** (MR) technologies that enable novel ways of interacting with information. Much of my work explores applications of MR in **surgical settings**. I also study the challenges of **multi-user MR environments** and develop solutions that enhance both personal and shared experiences in these spaces.

Academic Experience

- **Assistant Professor** — Aug. 2025 - Current
  College of Computing, Grand Valley State University, USA
- **Graduate Research Fellow** — Sep. 2024 - Apr. 2025
  Department of Computer Science, University of Pittsburgh, USA
- **Research Intern, Human-Centered AI** — May. 2024 - Aug. 2024
  Toyota Research Institute, Los Altos, USA
  Mentor: Dr. Scott Carter
- **Research Intern, Augmented Perception Lab** — May. 2023 - Aug. 2023
  Carnegie Mellon University, Pittsburgh, USA
  Mentor: Dr. David Lindlbauer
- **Graduate Student Researcher** — May. 2021 - Apr. 2024
  Department of Computer Science, University of Pittsburgh, USA

Education

- **PhD in Computer Science** — Aug. 2020 - APR. 2025
  University of Pittsburgh, USA
  Advisor: Dr. Jacob Biehl
- **MS in Computer Science** — Sep. 2018 - Jun. 2020
  University of California, Irvine, USA
- **BS in Computer Science** — Aug. 2014 - Jun. 2018
  Lahore University of Management Sciences, Pakistan

Teaching Experience

- **Graduate Teaching Assistant** — Sep. 2020 - Apr. 2021
  University of Pittsburgh, USA
  Courses: *Algorithm Implementation, Programming Language for Web Applications*
- **Graduate Teaching Assistant** — Oct. 2018 - May. 2020
  University of California, Irvine, USA
  Courses: *Intermediate Programming (Python), Data Structures (C++), Intro to C++*
- **Undergraduate Teaching Assistant** — Sep. 2017 - May. 2018
  Lahore University of Management Sciences, Pakistan

Courses: *Applied Probability (Graduate-level), Probability*

PUBLICATIONS

Conference & Proceedings

[C.4] Shadows of Reality: Enhancing Bystander Awareness of Mixed Reality Interfaces
Talha Khan, Abigail Zimmerman, Edward Andrews, David Lindlbauer, Jacob Biehl
To appear in (ACM SUI 2025)

[C.3] Don't Block My Stuff: Fostering Personal Object Awareness in Multi-user Mixed Reality Environments
Talha Khan, David Lindlbauer
PACM HCI (ACM ISS 2024)

[C.2] Understanding Perceived Utility and Comfort of In-Home General-Purpose Sensing through Progressive Exposure
Pranut Jain, Andrew Xu, Thomas Downes, Injung Kim, **Talha Khan**, Jacob Biehl, Adam Lee.
PACM HCI (ACM CSCW 2024)

[C.1] Understanding Effects of Visual Feedback Delay in AR on Fine Motor Surgical Tasks
Talha Khan, Toby Zhu, Thomas Downes, Lucille Cheng, Nicolás Kass, Edward Andrews, Jacob Biehl.
IEEE TVCG (ISMAR 2023) **Best Paper Award**

Journal Publications

[J.3] Evolution of the meta-neurosurgeon: A systematic review of the current technical capabilities, limitations, and applications of augmented reality in neurosurgery
Nikhil Sharma, Arka Mallela, **Talha Khan**, Stephen Paul Canton, Nicolás Kass, Fritz Steuer, Jacquelyn Jardini, Jacob Biehl, Edward Andrews.
Surgical Neurology International 2024

[J.2] Solar-powered Parking Analytics System using Deep Reinforcement Learning
Yoones Rezai, **Talha Khan**, Stephen Lee, Daniel Mossé
ACM TOSN 2023

[J.1] A systematic comparison of the accuracy of monocular RGB tracking and LiDAR for neuronavigation
Talha Khan, Jacob Biehl, Edward Andrews, Dmitriy Babichenko
HTL 2022

Other Publications

[W.3] Future of Surgical Mixed Reality: Cutting-Edge or Cutting Too Deep?
Talha Khan, Edward Andrews, Jacob Biehl
IEEE VRW 2024

[W.2] EndovasculAR: Utility of Mixed Reality to Segment Large Displays in Surgical Settings
Griffin Hurt, **Talha Khan**, Michael Kann, Edward Andrews, Jacob Biehl
IEEE VRW 2024

[WiP.1] AR in the OR: exploring use of augmented reality to support endoscopic surgery
Talha Khan, Edward Andrews, Paul Gardner, Arka Mallela, Jeffrey Head, Joseph Maroon, Georgios Zenonos, Dmitriy Babichenko, Jacob Biehl
ACM IMX 2022

[EA.1] AR in the OR: exploring use of augmented reality to support endoscopic surgery
Talha Khan, Edward Andrews, Paul Gardner, Arka Mallela, Jeffrey Head, Joseph Maroon, Georgios Zenonos, Dmitriy Babichenko, Jacob Biehl
ACM IMX 2022

Mentorship Experience

- Abby Zimmerman — Sep. 2024 - Jan. 2025
  BS Digital Narrative and Interactive Design, University of Pittsburgh, USA
  Project: *Shadows of Reality: Enhancing Bystander Awareness of Mixed Reality Interfaces*
- Bo-Chen Kuo — Jan. 2024 - Apr. 2024
  MS Computer Science, University of Pittsburgh, USA
  Project: *Automatic Segmentation of Medical Appliance Buttons*
- Elliott Finney — Jan. 2024 - Apr. 2024
  BS Computer Science, University of Pittsburgh, USA
  Project: *Multi-modal Mixed Reality Interfaces for Medical Appliances*
- Griffin Hurt — May. 2023 - Apr. 2024
  BS Computer Science, University of Pittsburgh, USA
  Thesis: "Untethered Displays: The Effects of Mixed Reality on Split-Attention in Fine-Motor Tasks"
- Aiden Dorneich — Jun. 2021 - Aug. 2021
  Research Intern Facet Lab, University of Pittsburgh, USA
  Project: *Automatic Human-Humanoid Gesture Imitation*
- Chloe Dahan — Jun. 2021 - Aug. 2021
  BS Digital Narrative and Interactive Design, University of Pittsburgh
  Project: *Automatic Human-Humanoid Gesture Imitation*

Honors and Awards

- CS 50 Fellowship Award, Department of Computer Science, University of Pittsburgh — Apr. 2024
- Best Journal Paper Award, IEEE International Symposium of Mixed and Augmented Reality — Oct. 2023
- Honorable Mention Award, Link Foundation Modelling, Simulation & Training Fellowship — Jun. 2022

Media Appearances

- **Pitt To The Point** — Mar. 2024
  Revolutionizing Healthcare With Mixed Reality

Invited Talks

- **Dean's Spotlight Series, University of Pittsburgh** — Jan. 2023
  AR in the OR: An Interdisciplinary Journey Towards the Holographic Operation Room

Leadership Experience

- **Business Manager** — Mar. 2024 - APR. 2025
  Doctoral Guild at Pitt, University of Pittsburgh, USA
- **Founding Member** — Apr. 2023 - Current
  Surreality Lab, University of Pittsburgh, USA
- **Founding Member** — Jan. 2021 - Apr. 2023
  The Alba Tull Center for Neuroimaging and Therapeutics
  University of Pittsburgh, USA

Reviewing Service

- ACM CHI Conference on Human Factors in Computing Systems *(ACM CHI 2025)*
- ACM Symposium on User Interface Software and Technology *(ACM UIST 2024)*
- ACM CHI Conference on Human Factors in Computing Systems *(ACM CHI 2024)*
- ACM CHI Conference on Human Factors in Computing Systems *(ACM CHI 2023)*
- ACM Conference On Computer-Supported Cooperative Work And Social Computing *(ACM CSCW 2023)*

Volunteer Service

- Student Volunteer, ACM Conference on Interactive Surfaces and Spaces (ACM ISS 2023)
- Student Volunteer, ACM Conference on Human Factors in Computing Systems (ACM CHI 2022)

References

Dr. Jacob Biehl
Associate Professor, Department of Computer Science, University of Pittsburgh, USA
https://jtbiehl.github.io/ | ✉ biehl@pitt.edu

Dr. David Lindlbauer
Assistant Professor, Human-Computer Interaction Institute, Carnegie Mellon University, USA
https://www.davidlindlbauer.com/ | ✉ davidlindlbauer@cmu.edu

Dr. Scott Carter
Senior Staff Research Scientist, Toyota Research Institute, Los Altos, USA
https://www.madpickle.net/scott/ | ✉ scott.carter@tri.global

Dr. Erin Walker
Associate Professor, Department of Computer Science, University of Pittsburgh, USA
https://erinwalker.academicwebsite.com/ | ✉ eawalker@pitt.edu

Dr. Edward Andrews
Assistant Professor, Department of Neurological Surgery, University of Pittsburgh, USA
✉ andrewse2@upmc.edu