Courtney Hutton Pospick

Ph.D. Candidate, Mixed Reality and HCI

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Education

Exp. May 2024 **Ph.D.**, *University of Minnesota*, Minneapolis, MN.
Computer Science & Engineering, advised by Evan Suma Rosenberg

2016 – 2018 **Ph.D.**, *University of Southern California*, Los Angeles, CA.
Computer Science & Engineering, advised by Evan Suma Rosenberg

2013 – 2016 **B.A.**, *Occidental College*, Los Angeles, CA.
Mathematics

Scholarship & Awards

2020 – 2022 **ARCS Foundation 3M Scholar**.
$10,000 merit-based award sponsored by 3M

2019 – 2020 **Graduate Assistance in Areas of National Need (GAANN) Fellow**.
Competitive fellowship covering full tuition, fees, and a need-based stipend

Research Interests

Augmented reality (AR) and virtual reality (VR); human computer interaction (HCI) in AR/VR; 3-D user interfaces for AR/VR; accessibility in AR/VR; cybersickness in VR; design methodologies

Research Experience

08/2018 – present **Graduate Research Assistant**, *University of Minnesota*, Minneapolis, MN.
Illusioneering Lab, advised by Evan Suma Rosenberg

- Published over six peer-reviewed scientific papers for ACM and IEEE conferences in HCI & 3D Graphics, including a VRST "Best Paper" award and more than five first-author publications.
- Created three spatial interaction techniques for path creation and manipulation; implemented end-to-end applications to evaluate each technique on both Vive and Oculus HMDs.
- Developed and administered qualitative and quantitative user studies to benchmark and compare interaction techniques; quantified usability, efficacy, and satisfaction through biometric and novel performance-based metrics.
- Partnered with multi-disciplinary researchers in Kinesiology and Cognitive Science to investigate perceptual illusions to mitigate cybersickness; contributed to three psychophysical and perception studies for the manipulation of optic flow, leading to two publications.

- Extended existing UX metrics for 2D interfaces to 3D environments, including a performance-based measure to assess the learnability of new interactions among novice and expert users.
- Designed and prototyped a low-cost, discreet wearable to improve emotional awareness through mindfulness using a community-based participatory design process; published the design at CHI 2019.

07/2021 – 09/2021 **Graduate Research Fellow**, *Magic Leap, Inc.*, Plantation, FL.

Product Research and Design. Supervised by Charlotte Vinkers.

- Planned and moderated two usability studies for proprietary technology; measured progress towards company objectives and key results by calculating detection and discrimination thresholds through psychophysical methods.
- Distilled initial findings into three actionable areas for improving user experience, drafted possible solutions for each area and presented these insights to senior management, human factors, and marketing.
- Collaborated on existing research projects to provide knowledge of qualitative experiment design and best principles for interaction in AR spaces.

05/2018 – 08/2018 **Graduate Research Intern**, *Army Research Lab*, Los Angeles, CA.

Supervised by Suya You

- Extended a digital sand table prototype for the HoloLens using Unity and Vuforia to aid military mission planning, collaboration, and data visualization; wrote custom HLSL shaders to manage object and field-of-view culling.
- Incorporated co-located multi-user capabilities for shared examination and markup of drone-captured terrain data.

08/2016 – 08/2018 **Graduate Research Assistant**, *University of Southern California*, Los Angeles, CA.

Institute for Creative Technologies, advised by Evan Suma Rosenberg

- Designed and executed a user study on individually calibrating rotation gain thresholds for redirected walking; analyzed additional data from this study to identify early cues of cybersickness in novice users.
- Examined novel mixed reality frameworks for non-co-located collaboration.
- Refined a simulator for modeling natural locomotion during redirected walking.

05/2017 – 08/2017 **Magic Lab Intern**, *PlayStation*, San Mateo, CA.

Research and Development, supervised by Richard Marks and Steven Osman

- Designed an experimental VR interface for the PlayStation VR headset backed by a local SQLite database of 200 VR assets during a partnership with Sony Music Group and the Jet Propulsion Laboratory.
- Identified and traced a bug in the Unity PS4 API that caused regular system freezes; the resulting update eliminated 100% of system freezes during garbage collection and enabled testing for gesture recognition interfaces.

Teaching & Mentoring Experience

01/2023 – present **Graduate Teaching Assistant**, *University of Minnesota*, CSCI 4611: Interactive Computer Graphics & Games.

08/2020 – present **Undergraduate Research Mentor**, *University of Minnesota*.

09/2021 – 05/2022 **Graduate Teaching Assistant**, *University of Minnesota*, CSCI 5801: Software Engineering.

06/2020 – 08/2022 **NSF REU Mentor**, *University of Minnesota*.

11/2019 – 03/2021 **Student Volunteer Chair**, *IEEE Virtual Reality 2020, 2021*.

08/2016 – 05/2017 **Graduate Teaching Assistant**, *University of Southern California*, CSCI 109: Introduction to Computer Science.

Publications

Refereed Papers

[1] C. Hutton Pospick and E. Suma Rosenberg. Creating and Manipulating 3D Paths With Mixed Reality Spatial Interfaces. In *Frontiers in Virtual Reality*, vol. 4(2023). doi:10.3389/frvir.2023.1192757.

[2] J. Thomas, C. Hutton Pospick, and E. Suma Rosenberg. Towards physically interactive virtual environments: Reactive alignment with redirected walking. In *26th ACM Symposium on Virtual Reality Software and Technology*. 2020. doi:10.1145/3385956.3418966. *[Best Paper Award]*.

[3] C. Hutton and S. Saravanan. ReMind: Improving emotional awareness for persons in recovery. In *2019 CHI Conference on Human Factors in Computing Systems*. 2019. doi:10.1145/3290607.3312997.

[4] C. Hutton, S. Ziccardi, J. Medina, and E. Suma Rosenberg. Individualized calibration of rotation gain thresholds for redirected walking. In *ICAT-EGVE 2018 - International Conference on Artificial Reality and Telexistence and Eurographics Symposium on Virtual Environments*, pp. 61–64. 2018. doi:10.2312/egve.20181315.

Conference Posters

[1] C. Hutton, S. Ziccardi, J. Medina, and E. Suma Rosenberg. Please don't puke: Early detection of severe motion sickness in VR. In *2018 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, pp. 579–580. 2018. doi:10.1109/VR.2018.8446382.

[2] C. Hutton and E. Suma. A realistic walking model for enhancing redirection in virtual reality. In *2016 IEEE Virtual Reality (VR)*, pp. 183–184. 2016. doi:10.1109/VR.2016.7504714.

Doctoral Consortiums

[1] C. Hutton. Augmented reality interfaces for semi-autonomous drones. In *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, pp. 1361–1362. 2019. doi:10.1109/VR.2019.8797893.

Research Demonstrations

[1] C. Hutton, N. Sohre, B. Davis, S. J. Guy, and E. Suma Rosenberg. An augmented reality motion planning interface for robotics. In *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, pp. 1313–1314. 2019. doi:10.1109/VR.2019.8798010.

[2] C. Hutton and E. Suma Rosenberg. Augmented reality motion planning for drones. In *Driven to Discover (D2D) at the Minnesota State Fair*. University of Minnesota, Minneapolis, MN. 2019.

Service & Professional Activities

Peer-Review Experience

IEEE Virtual Reality and 3-D User Interaction

IEEE Transactions on Visualization and Computer Graphics

ACM Symposium on Virtual Reality Software and Technology

ACM Symposium on User Interaction

IEEE Workshop on Interaction and Spatial Perception

Professional Organizations

Student Member, Association for Computing Machinery (ACM)

Student Member, Institute of Electrical and Electronics Engineers (IEEE)

Media

"Redirected Walking and Physical Interaction," *Journey's Edge*, Notion-Theory. Podcast, 2021. notiontheory.com/podcast