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Engineering & Scientific Consulting

Alex Peer, Ph.D.

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Professional Profile

Alex Peer applies his expertise in augmented and virtual reality, human depth perception, computer and data sciences, human-computer interaction and human participant studies to assist clients with a variety of needs. He has experience bringing questions about user's experiences with software or hardware from initial ideation all the way through to actionable insight -- from experimental design and execution through to data exploration, statistical analysis, and interactive visualization.

The breadth of his academic training and more than 15 years of programming experience ensures that should a needed experimental stimuli or analysis tool not yet exist, Alex can likely create it.

Alex received his Ph.D. in December 2021 from the University of Wisconsin - Madison, for work focusing on human distance misperception in virtual reality. During this work, he designed software for experimental stimuli and data analysis, as well as experimental protocols to explore the phenomenon of distance misperception. His contributions include a potential mitigation method for distance misperception, and a method to adjust for differences in distance estimates across different methods of measurement. In the course of the work he also developed tools to measure human visual and stereo acuity as mediated by VR displays, and developed a method to correct for tracking artifacts seen in a consumer-grade motion tracking system to make it practical for use in perceptual experiments.

Prior to his Ph.D. work, Alex completed an M.S. degree with a focus on natural language processing in a human-robot interaction context, developing software to drive robot motion and vision. He also co-developed an interactive media creation tool presented as a website, participating as a full-stack developer on a team of two to develop fully custom back- and front-ends, including database architecture, UI/UX, and integrating cloud services.

Alex is a proficient generalist programmer and can approach problems involving any programming language or environment, with particular depth of experience in C++, C#, R, Python, PHP, Java, Javascript, HTML / CSS, and AWS, in contexts including real-time graphics, interactive media, machine learning, embedded systems, wearable technology, and data science.

Academic Credentials & Professional Honors

Ph.D., Computer Sciences, University of Wisconsin, Madison, 2021

M.S., Computer Science, Michigan State University, 2012

Prior Experience

Doctoral Researcher, Department of Computer Sciences, University of Wisconsin – Madison, 2014-2021

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Teaching Assistant, Department of Computer Sciences, University of Wisconsin – Madison, 2012-2013

Head Graduate Assistant, Michigan State University, 2010-2012

Chief Technology Officer, Blabberize.com, 2007-2021

Professional Affiliations

Association for Computing Machinery (ACM), Member

Institute of Electrical and Electronics Engineers (IEEE), Member

Publications

Conference Papers

A. Peer and K. Ponto (2020). “Measuring Visual Acuity and Stereo Accuracy as Mediated by Immersive Displays”. In: 2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW). IEEE, pp. 219–223. https://doi.org/10.1109/VRW50115.2020.00047

A. Peer and K. Ponto (2019). “Mitigating Incorrect Perception of Distance in Virtual Reality through Personalized Rendering Manipulation”. In: 2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR). IEEE, pp. 244–250. https://doi.org/10.1109/VR.2019.8797911

R. Tredinnick, G. Casper, C. Arnott-Smith, A. Peer, and K. Ponto (2018). “Using Virtual Reality to Study Health in the Home”. In: 2018 IEEE Workshop on Augmented and Virtual Realities for Good (VAR4Good). IEEE, pp. 1–5. https://doi.org/10.1109/VAR4GOOD.2018.8576886

A. Peer and K. Ponto (2017a). “Evaluating perceived distance measures in room-scale spaces using consumer-grade head mounted displays”. In: 2017 IEEE Symposium on 3D User Interfaces (3DUI). IEEE, pp. 83–86. https://doi.org/10.1109/3DUI.2017.7893321

Conference Poster Papers

A. Peer, P. Ullrich, and K. Ponto (2018). “Vive tracking alignment and correction made easy”. In: 2018 IEEE conference on virtual reality and 3D user interfaces (VR). IEEE, pp. 653-654. https://doi.org/10.1109/VR.2018.8446435

A. Peer and K. Ponto (2017b). “Preliminary exploration: Perceived egocentric distance measures in room-scale spaces using consumer-grade head mounted displays”. In: 2017 IEEE Virtual Reality (VR). IEEE, pp. 275–276. https://doi.org/10.1109/VR.2017.7892283

A. Peer (2017). “On exploring the mitigation of distance misperception in virtual reality”. In: 2017 IEEE Virtual Reality (VR). IEEE, pp. 415–416. https://doi.org/10.1109/VR.2017.7892353

A. Peer and K. Ponto (2016b). “Perceptual space warping: Preliminary exploration”. In: 2016 IEEE Virtual Reality (VR). IEEE, pp. 261–262. https://doi.org/10.1109/VR.2016.7504753

Journal Articles

P. Hoonakker, G. Casper, A. Peer, C. A. Smith, R. Tredinnick, N. Werner, and K. Ponto (2018). “Healthcare in a Virtual Environment: Workload and Simulation Sickness in a 3D CAVE”. in: Congress of the International Ergonomics Association. Springer, pp. 281–289. https://doi.org/10.1007/978-3-319-96077-7_29

E. G. Weigel, N. D. Testa, A. Peer, and S. C. Garnett (2015). “Context matters: sexual signaling loss in

digital organisms”. In: Ecology and evolution 5.17, pp. 3725–3736. https://doi.org/10.1002/ece3.1631

Presentations

Invited Talks

Peer, A., "Distance Misperception in VR and AR, and the Possibility of Individual Calibration". Hi5 Lab, The University of Mississippi, via Internet. July 3, 2020.
https://www.youtube.com/watch?v=UyYcQWG5s3E

Conference Presentations

A. Peer and K. Ponto. “Measuring Visual Acuity and Stereo Accuracy as Mediated by Immersive Displays”. 2020 IEEE Workshop on Perceptual and Cognitive Issues in AR., via Internet. March 22, 2020.

A. Peer and K. Ponto. “Mitigating Incorrect Perception of Distance in Virtual Reality through Personalized Rendering Manipulation”. 2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), Osaka, Japan. March 25, 2019.

R. Tredinnick, G. Casper, C. Arnott-Smith, A. Peer, and K. Ponto. “Using Virtual Reality to Study Health in the Home”. 2018 IEEE Workshop on Augmented and Virtual Realities for Good (VAR4Good), Reutlingen, Germany. March 18, 2018.

A. Peer and K. Ponto. “Evaluating perceived distance measures in room-scale spaces using consumer-grade head mounted displays”. 2017 IEEE Symposium on 3D User Interfaces (3DUI), Los Angeles, CA. March 18, 2017.

A. Peer. “On exploring the mitigation of distance misperception in virtual reality”. 2017 IEEE Virtual Reality (VR) Doctoral Consortium, Los Angeles, CA. March 18, 2017.

Poster Presentations

A. Peer and K. Ponto. “Preliminary exploration: Perceived egocentric distance measures in room-scale spaces using consumer-grade head mounted displays”. 2018 Wisconsin Institute for Discovery Symposium, Madison, WI. July 13, 2018.

A. Peer, P. Ullrich, and K. Ponto. “Vive tracking alignment and correction made easy”. 2018 IEEE conference on virtual reality and 3D user interfaces (VR), Reutlingen, Germany. March 21, 2018.

A. Peer and K. Ponto. “Preliminary exploration: Perceived egocentric distance measures in room-scale spaces using consumer-grade head mounted displays”. 2017 IEEE Virtual Reality (VR), Los Angeles, CA. March 20, 2017.

A. Peer. “On exploring the mitigation of distance misperception in virtual reality”. 2017 IEEE Virtual Reality (VR), Los Angeles, CA. March 20, 2017.

Peer, A., Ponto, K., “Perceptual Space Warping: Preliminary Exploration”. 8th Annual McPherson Eye Research Institute Vison Science Poster Session, Madison, Wisconsin. October 4, 2016.

A. Peer and K. Ponto. “Perceptual space warping: Preliminary exploration”. 2016 IEEE Virtual Reality (VR), Greenville, SC. March 21, 2016.

Peer Reviews

IEEE Virtual Reality (VR), 2017-2021

IEEE Transactions on Visualization and Computer Graphics (TVCG), 2021

Virtual Reality Software and Technology (VRST), 2020

International Symposium on Mixed and Augmented Reality (ISMAR), 2019 - 2020

International Journal of Human-Computer Studies, 2019 - 2020

ETRI Journal, 2018