Yuan Li

Contact Information

Phone: (208)807-6797 *E-mail:* lymario92@gmail.com *Website:* www.yuanli3d.com/

Summary

I am a passionate computer science researcher and engineer with a background in human-computer interaction (HCI), Augmented and Virtual Reality (AR/VR), Computer Supported Collaborative Work (CSCW), and 3D User Interfaces (3DUI). Throughout my graduate studies, I have explored how AR/VR systems can facilitate collaboration, communication, and shared understanding to foster interactions among users regardless of their spatial locations. Specifically, I build and test collaborative AR/VR systems that help collocated, distant, and remote users efficiently, accurately, and intuitively express and exchange spatial references essential for various tasks, such as education, construction, etc.

Research Interest

Augmented Reality; Virtual Reality; User Interaction; Computer Supported Collaborative Work;

Education

Virginia Tech, Department of Computer Science, *08/2017-05/2022(expected)*
- Ph.D. in Computer Science GPA: **3.85/4** Advised by Dr. Doug A. Bowman
- Ph.D. Dissertation: Assisting Spatial Referencing for Collaborative Augmented Reality
- Committee Member: Dr. Joseph L. Gabbard, Dr. Tobias Höllerer, Dr. Wallace, Lages, Dr. Sang Won Lee
- Research Assistant on interaction techniques, augmented and virtual reality

Boise State University, Department of Computer Science *08/2015-08/2017*
- M.S. in Computer Science GPA: **3.96/4** Advised by Dr. Steven Cutchin
- Master Thesis: Editable View Optimized Tone Mapping For Viewing High Dynamic Range Panoramas On Head Mounted Display
- Research Assistant in Visualization Laboratory on virtual reality graphics

Zhejiang University, College of Computer Science & Technology *09/2011-06/2015*
- B.E. in Computer Science & Technology GPA: **3.63/4**
- Bachelor Thesis: Gesture Communication in Immersive Virtual Environment
- Advisor: Dr. Mingli Songa6

Research Experience

ARCritique - Assisting Remote Design Critique through Mobile AR, Virginia Tech
Multidisciplinary Project: CS, Industrial Design, School of Education, School of Visual Art *05/2020-present*
- Designing and Implementing AR iOS app aiming to help design students with their study and research during Covid-19 by supporting rapid scanning of physical artifact, instant sharing with remote faculty, and simultaneous model inspection in shared AR space

Gaze Visualization Techniques for Collaborative Wide-Area Model-Free AR, Virginia Tech
Advisor: Professor. Doug A. Bowman *09/2019-Present*
- Re-evaluating previous work on gaze visualization techniques using simulated AR in more ecologically valid model-free AR setup.
- Building a wide-area alignment and synchronization system that allows for precise location sharing and spatial communication in large-scale (300 ft) outdoor places.

Quality Assessment of Bare-handed Collaboration Interaction in Augmented Reality, Virginia Tech
Advisor: Professor. Doug A. Bowman & Professor Sang Won Lee *03/2019-06/2020*
- Explored collaborative interfaces for bare-handed interaction in object referencing in augmented reality

Gaze Visualization Techniques in Collaborative Simulated Model-Free AR, Virginia Tech
Advisor: Professor. Doug A. Bowman *03/2018-06/2019*
- Designed and implemented multiple gaze ray visualizations to convey collaborator awareness in model-free environment in simulated AR

Evaluation of Model Free 3D Point Marking Techniques in Augmented Reality, Virginia Tech
Advisor: Professor. Doug A. Bowman *09/2017-11/2018*
- Designed and studied novel interaction techniques to mark 3D point positions without knowledge of environment geometry in mobile augmented reality

Real Time Tone Mapping Editing in Immersive Environment, Boise State University
Advisor: Professor. Steven Cutchin *09/2016-07/2017*
- Improvement to previous work on view dependent tone mapping operator that enables real time tone mapping parameters editing for different artistic effects

View Dependent Tone Mapping for HDR Panorama on Head Mounted Displays, Boise State University
Advisor: Professor. Steven Cutchin *01/2016-09/2016*
- Designed and implemented optimized tone mapping operator for high resolution (up to 16K) HDR panoramas based on user view port

Publications

JOURNAL PAPERS

- **Yuan Li**, Donghan Hu, Boyuan Wang, Doug A. Bowman, Sang Won Lee. *"The Effects of Incorrect Occlusion Cues on the Understanding of Bare-handed Referencing in Collaborative Augmented Reality."* Frontiers in Virtual Reality Augmented Reality, July 2021. DOI: 10.3389/frvir.2021.681585

CONFERENCE PAPERS

- Feiyu Lu, Shakiba Davari, Lee Lisle, **Yuan Li**, Doug A. Bowman, *"Glanceable AR: Evaluating Information Access Methods for Head-Worn Augmented Reality"* in the IEEE Conference on Virtual Reality and 3D User Interface (IEEE VR), Atlanta, GA, USA, IEEE, Mar 2020. DOI: 10.1109/VR46266.2020.00113
- **Yuan Li**, Feiyu Lu, Wallace S. Lages, Doug A. Bowman. *"Gaze Direction Visualization Techniques for Collaborative Wide-Area Model-Free Augmented Reality."* Proceedings of the 2019 Spatial User Interaction, ACM, Oct 2019 DOI: 10.1145/3357251.3357583
- Wallace S. Lages, **Yuan Li**, Lee Lisle, Tobias Höllerer and Doug A. Bowman. *"Enhanced Geometric Techniques for Point Marking in Model-Free Augmented Reality."* Proceedings of the 2019 International Symposium on Mixed and Augmented Reality. IEEE, Oct 2019. DOI: 10.1109/ISMAR.2019.00028
- **Yuan Li**, and Steve. Cutchin. *"View dependent tone mapping of HDR panoramas for head mounted displays."* Proceedings of the 26th International Conference on Artificial Reality and Telexistence and the 21st Eurographics Symposium on Virtual Environments. Eurographics Association, Oct 2016. DOI: 10.2312/egve.20161431

OTHER REFERRED PUBLICATIONS (POSTERS, WORKSHOPS, DEMOS)

- **Yuan Li**, David Hicks, Wallace S. Lages, Sang Won Lee, Akshay Sharma, Doug A. Bowman. *"ARCritique: Supporting Remote Design Critique of Physical Artifacts through Collaborative Augmented Reality."* in the IEEE Conference on Virtual Reality and 3D User Interfaces (IEEEVR), Lisbon, Portugal, 2 pages, IEEE, Mar 2021. DOI: 10.1109/VRW52623.2021.00175
- Shakiba Davari, Feiyu Lu, **Yuan Li**, Lee Lisle, Lei Zhang, Xueting Feng, Leslie Blustein, and Doug A. Bowman, *"Integrating Everyday Proxy Objects in Multi-Sensory Virtual Reality Storytelling,"* in Proceedings of the Everyday Proxy Objects for Virtual Reality Workshop at CHI 2021 (EPO4VR), Yokohama, Japan, 5 pages, ACM, May 2021.
- **Yuan Li**, *"Spatial Referencing for Anywhere, Anytime Augmented Reality"* in the IEEE Conference on Virtual Reality and 3D User Interfaces (IEEEVR), Atlanta, USA, 2 pages, IEEE, Mar 2020. DOI: 10.1109/VRW50115.2020.00129
- Wallace S. Lages, **Yuan Li**, Lee Lisle, Tobias Höllerer and Doug A. Bowman. *"[Demo] Enhanced Geometric Techniques for Point Marking in Model-Free Augmented Reality."* Proceedings of the 2019 International Symposium on Mixed and Augmented Reality. IEEE, Oct 2019. Invited demo.
- Shakiba Davari, **Yuan Li**, Lee Lisle, Feiyu Lu, Lei Zhang, Leslie Blustein, Xueting Feng, Brianna Gabaldon, Marc Kwiatkowski, and Doug A. Bowman, *"Save the Space Elevator: An Escape Room Scenario Involving Passive Haptics in Mixed Reality,"* in the IEEE Conference on Virtual Reality and 3D User Interfaces (IEEEVR), Osaka, Japan, 2 pages, IEEE, Mar 2019. DOI: 10.1109/VR.2019.8798051
- **Yuan Li**, *"Exploring User Interfaces for Collaborative Model-Free Augmented Reality Point Marking at a Distance"* in the 2018 International Symposium on Mixed and Augmented Reality. IEEE, Munich, Germany, Oct 2018.
- **Yuan Li**, Run Yu, Lei Zhang, Wallace S. Lages, Doug A. Bowman, *"Climb, Direct, Stack: Smart Interfaces for ELeague Contest,"* in the IEEE Conference on Virtual Reality and 3D User Interfaces (IEEEVR), Reutlingen, Germany, 2 pages, IEEE, Mar 2018. DOI: 10.1109/VR.2018.8446131
- Wallace S Lages, **Yuan Li**, Doug A. Bowman. *"Evaluation of Environment-Independent Techniques for 3D Position Marking in Augmented Reality"* in the IEEE Conference on Virtual Reality and 3D User Interfaces (IEEEVR), Reutlingen, Germany, 2 pages, IEEE, Mar 2018. DOI: 10.1109/VR.2018.8446055

Skills

Commonly Used Programming Languages:	C#, C/C++, Java, Objective-C, Swift
Programming Platforms:	Proficient in Unity; familiar with OpenGL, WebGL, Vuforia, Photon
Mixed Reality Devices:	Proficient in commercial VR head worn displays supported by SteamVR (VIVE, Rift) and developer oriented AR head worn displays (HoloLens1 and HoloLens2); familiar with ARKit, Windows motion capture system (Kinect)
Data Analysis:	Familiar with Matlab, R and SPSS