

RESEARCH INTERESTS

My research interest lies at the intersection of Augmented/Virtual Reality and Human Computer Interaction, with a primary focus on understanding how humans perceive and interact with 3D content. Based on these understandings, I've been exploring systems that can leverage perceptual factors with VR/AR to improve user performance and enhance the 3D experience in the virtual environment.

EDUCATION

2014. 09	PhD Candidate in Computer Engineering
2020. 05	University of British Columbia, BC, Canada Thesis: Improving Spatial Perception with a Spherical Fish Tank VR Display Advisor: Sidney S. Fels
2011. 09	Dual Master in Electrical & Computer Engineering and Instrument Science
2014. 05	Georgia Institute of Technology & Shanghai Jiao Tong University, Shanghai, China
2007. 09	Bachelor in Instrument Engineering
2011. 05	Tianjin University, Tianjin, China

PUBLICATIONS

Journal Article

2019	An Evaluation of Depth and Size Perception on a Spherical Fish Tank Virtual Reality Display Q Zhou, G Hagemann, D Fafard, I Stavness, S Fels IEEE Transactions on Visualization and Computer Graphics 25 (5), 2040-2049
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Conference Publication

2020	Gripmarks: Using Hand Grips to Transform In-Hand Objects into Mixed Reality Input Q Zhou, S Sykes, S Fels, K Kin ACM CHI Conference on Human Factors in Computing Systems, to appear
2020	Investigating the Duality of Size Perception in a Spherical Fish Tank VR Display Q Zhou, F Wu, I Stavness, S Fels ACM CHI Conference on Human Factors in Computing Systems, to appear
2019	FTVR in VR: Evaluation of 3D Perception with a Simulated Volumetric Fish Tank VR Display D Fafard, I Stavness, M Dechant, R Mandryk, Q Zhou, S Fels ACM CHI Conference on Human Factors in Computing Systems, 533-545



- 2019 **Investigating Spherical Fish Tank Virtual Reality Displays for Establishing Realistic Eye-Contact**
G Hagemann, Q Zhou, I Stavness, S Fels
IEEE Conference on Virtual Reality and 3D User Interfaces (VR), 950-951
- 2019 **Crystal Palace: Merging Virtual Objects and Physical Hand-held Tools**
T Kashiwagi, K Sumi, S Fels, Q Zhou, F Wu
IEEE Conference on Virtual Reality and 3D User Interfaces (VR), 1411-1412
- 2019 **I Got Your Point: An Investigation of Pointing Cues in a Spherical Fish Tank VR Display**
F Wu, Q Zhou, K Seo, T Kashiwagi, S Fels
IEEE Conference on Virtual Reality and 3D User Interfaces (VR), 1237-1238
- 2019 **Match the Cube: Investigation of the Head-coupled Input with a Spherical Fish Tank VR**
Q Zhou, F Wu, I Stavness, S Fels
IEEE Conference on Virtual Reality and 3D User Interfaces (VR), 1281-1282
- 2018  **Design and Implementation of a Multi-person Fish Tank Virtual Reality Display**
DB Fafard, Q Zhou, C Chamberlain, G Hagemann, S Fels, I Stavness
ACM Symposium on Virtual Reality Software and Technology (VRST)
- 2018 **Here's looking at you: A Spherical FTVR Display for Realistic Eye-Contact**
G Hagemann, Q Zhou, I Stavness, ODA Prima, S Fels
ACM International Conference on Interactive Surfaces and Spaces (ISS), 357-362
- 2018 **Coglobe: a Co-located Multi-person FTVR Experience**
Q Zhou, G Hagemann, S Fels, D Fafard, A Wagemakers, C Chamberlain, I Stavness
ACM SIGGRAPH 2018 Emerging Technologies.
- 2017 **Automatic Calibration of a Multiple-projector Spherical Fish Tank VR Display**
Q Zhou, G Miller, K Wu, D Correa, S Fels.
IEEE Winter Conference on Applications of Computer Vision (WACV), 1072-1081
- 2017  **3DPS: An Auto-calibrated Three-dimensional Perspective-corrected Spherical Display**
Q Zhou, K Wu, G Miller, I Stavness, S Fels
IEEE Virtual Reality (VR), 455-456
- 2017 **Calibration Methods for Effective Fish Tank VR in Multi-screen Displays**
D Fafard, A Wagemakers, I Stavness, Q Zhou, G Miller, S Fels
ACM CHI Extended Abstracts on Human Factors in Computing Systems, 373-376
- 2016 **Analysis and Practical Minimization of Registration Error in a Spherical Fish Tank VR**
Q Zhou, G Miller, K Wu, I Stavness, S Fels
Asian Conference on Computer Vision, 519-534
- 2014 **Parameter Estimation of Photoacoustic Signal for Glucose Solutions using Laplace Wavelet Correlation Filtering and Least Square Estimation**
Q Zhou, S Zhao, J Wei, H Yan, H Zhao
Applied Mechanics and Materials, 225-235

WORK EXPERIENCE

2014. 09 – 2020. 04 **Research Assistant, *University of British Columbia, Canada***

Mentor: Dr. Sidney Fels and Dr. Gregor Miller

Designed and prototyped collaborative 3D spherical displays. Integrated and calibrated 3D displays with several tracking systems. Implemented stereoscopic rendering to generate undistorted perspective-corrected imageries on spherical screens. Evaluated spatial visualization by conducting perception factor studies using spherical display prototypes.

2018. 05 – 2018. 08 **Research Intern, *Facebook Reality Labs, USA***

Mentor: Dr. Kenrick Kin

Designed and implemented a gesture-based approach that supports interactions with handheld objects for Mixed Reality. Evaluated the system in user studies across five physical objects and built two illustrative applications.

2014. 03 – 2014. 05 **Multimedia Engineer Intern, *Spreadtrum Communications, China***

Mentor: Jingming Xu

Designed and tested motion filtering algorithms for camera jittering stabilization

SELECTED PRESENTATIONS

2019 Mar **An Evaluation of Depth and Size Perception on a Spherical Fish Tank VR**

Virtual Reality and 3D User Interface, Osaka, Japan

2018 Aug **CoGlobe: a Co-located Multi-person FTVR Experience**

Siggraph, Vancouver, BC, Canada

2018 Mar **Spherical Fish Tank VR displays**

Invited talk at VR Emerging Media Community of Practice, Vancouver, BC, Canada

2017 Mar **Automatic Calibration of a Multiple-projector Spherical Fish Tank VR display**

Winter Conference on Applications of Computer Vision (WACV), Santa Rosa, CA, USA

AWARDS AND SCHOLARSHIPS

2019 **SIGCHI Honorable Mention**

FTVR in VR: Evaluation of 3D Perception with a Simulated Volumetric FTVR Display

2018 **ACM VRST Polyphony Digital Award**

Design and Implementation of a Multi-person Fish-Tank Virtual Reality Display

2017 **IEEE VR Best Demo Honorable Mention**

3DPS: An auto-calibrated 3D perspective-corrected spherical display

2014-2018 **Four Year Fellowship**

University of British Columbia

2011-2014	Coulter Fellowship Georgia Institute of Technology
2008	Kitano Consortium Scholarship Tianjin University

SELECTED PRESS

2019	Spherical display brings virtual collaboration closer to reality ScienceDaily https://www.sciencedaily.com/releases/2019/02/190219080745.htm
2019	“Crystal ball” takes virtual reality to next level City News in Vancouver https://www.btvancouver.ca/videos/crystal-ball-takes-virtual-reality-to-next-level/
2019	Researchers invent more realistic sociable Virtual Reality Interesting Engineering https://interestingengineering.com/researchers-invent-more-realistic-sociable-virtual-reality?utm_source=rss&utm_medium=article&utm_content=19022019
2019	CoGlobe: collaborative VR in a fish tank Siggraph https://blog.siggraph.org/2019/02/coglobe-collaborative-vr-in-a-fish-tank.html/

TEACHING

2017	CPEN 541 Human Interface Technologies (Assistant)
2016	CPSC 314 Computer Graphics (Assistant)
2015	EECE 418 Human Computer Interfaces in Engineering Design (Assistant)

PAPER REVIEW SERVICE

2020	ACM Designing Interactive Systems (DIS)
2020	ACM Computer Supported Cooperative Work (CSCW)
2020	ACM SIGCHI
2020	IEEE Virtual Reality and 3D User Interfaces (VR)
2019	ACM User Interfaces and Software Technology (UIST)
2018	IEEE International Symposium on Mixed and Augmented Reality (ISMAR)
2017-18	Graphic Interface (GI)