Danhua Zhang

PhD Student, Mixed Reality, HCI, and Computer Graphics

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Education

University of Minnesota Twin Cities, MN, USA — *2019 - present*
Ph.D. Computer Science

University of Minnesota Twin Cities, MN, USA — *2017 - 2019*
M.S., Computer Science

Sun Yat-sen University, Guangzhou, China — *2013 - 2017*
B.S., Information and Computing Science

Technical Skills

Programming Languages: C/C++, C#, Processing, R script
Programming Software: MS Visual Studio, Matlab, R Studio
Libraries: OpenGL, OpenVR, VRPN, Photon PUN 2
Game Engine: Unity, Unreal
3D Modeling: Character Creator 3, iClone 7, Maya, Blender
Digital Art: PaintTool SAI, Davinci Resolve, Adobe PhotoShop, After Effects, Premier

Publications

Danhua Zhang, Malik Khadar, Brett W Schumacher, Madhava Raveendra, Sam Adeniyi, Fei Wu, Sahar Aseeri, and Evan Suma Rosenberg. "COVID-Vision: A Virtual Reality Experience to Encourage Mindfulness of Social Distancing in Public Spaces." *In 2021 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW). IEEE.* DOI:10.1109/VRW52623.2021.00231

Yuxuan Huang, **Danhua Zhang**, and Evan Suma Rosenberg. "DBA: Direction-Based Authentication in Virtual Reality" *In 2023 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW). IEEE.* DOI:10.1109/VRW58643.2023.00319 [Preprint]

Awards & Hornors

Awarded the **Honorable Mention of MCM**, 2016, COMAP
Awarded the **3rd Class Scholarship**, 2016, SYSU
Awarded the **3rd Class Scholarship**, 2015, SYSU

Work Experience

CSCI 4511W Introduction to Artificial Intelligence — *Fall 2022 - Spring 2023*
Teaching Assistant, UMN, USA

- Holding office hours for students' questions and grading assignments and projects

Research Experience

VR Authentication: Cognitive Methods of Memorization — *Jan. 2023 - Present*
Researcher, UMN, USA

- Collaborating with others to conduct a within-subject study to evaluate the efficiency and security of different VR authentication methods and compare the different cognitive methods of memorization
- Developed a 3D spatial user interface in Unreal Engine

Nurse Training: Virtual Simulation — *Sept. 2021 - Present*
Research Assistant, UMN, USA

- Collaborating with nursing experts to conduct a formative study to assess the feasibility and a follow-up study to evaluate the effectiveness and user acceptance
- Designed the interview questions and interviewed participants in person for their feedback on the designed training scenarios
- Developed a VR project of several nurse training scenarios
- Customized the patient avatar model, including appearance, voice and animation
- Built several 3D medical device models in Blender

Understanding Communication Technology and Social Behavior *Sept. 2020 - Present*

Research Assistant, UMN, USA

- Collaborating with psychologists to run the longitudinal experiment and develop customized software for the study
- Trained undergraduate research assistants to use the developed software
- Developed a multi-user VR application for mobile devices, supporting voice synchronization
- Developed a multi-user 3D application for Windows & MacOS to control the VR users

Motion Sickness: Postural Sway Analysis in VR *Sept. 2019 - May. 2020*
Research Assistant, UMN, USA

- Collaborated with kinesiologists to conduct a study to analyze the pattern of postural sway data when users' motion sickness level change
- Developed a software collecting data from a balance board for postural sway measurement
- Developed a software capable of collecting data from most commercial VR devices

Contest Projects

VR Authentication: Direction-Based Authentication *Dec. 2022 - Feb. 2023*
IEEE VR 3DUI Contest

- Designed a spatial user interface using snap-turning and an authentication system in VR
- Collaborated with others on the Unreal project
- Presented the publication in IEEE VR Conference 2023

COVID Vision: Mind Social Distances *Dec. 2020 - March 2021*
IEEE VR 3DUI Contest

- Developed the multi-user VR application for VR devices on PC
- Led the team to collaborate and organize the modules implemented by each member
- Provided the visualization, interaction and feedback method
- Presented the publication in IEEE VR Conference 2021

A Hot Bath: Optimization *Jan. - Feb. 2016*
The Mathematical Contest in Modeling - Problem A

- Learned thermodynamics and applied differential equation to dynamically describe the bath water temperature
- Used nonlinear programming for the optimization model
- Submitted a paper as a group of three

Relevant Completed Courses

CSCI 8980 **Special Topics: Game Engine Technologies**, fall 2019, UMN, USA
CSCI 5609 **Visualization**, spring 2019, UMN, USA
CSCI 8980 **Special Topics: Immersive User Interfaces**, fall 2018, UMN, USA
CSCI 5611 **Animation & Planning in Games**, spring 2018, UMN, USA
ARTS 3770 **Animation**, spring 2018, UMN, USA
CSCI 5607 **Fundamentals of Computer Graphics 1**, fall 2017, UMN, USA

Research Interests

Virtual Reality (VR) and Augmented Reality (AR)
3D user interface design
Human-Computer Interaction (HCI)
Computer Graphics and Animation

Languages

Chinese - Mandarin: Native speaker
English: Advanced

Reference Letters

Prof. Evan Suma Rosenberg (Ph.D. advisor): Associate Professor, UMN
Email: suma@umn.edu