Xian **WANG**

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Education

Hong Kong University of Science and Technology (HKUST)

Hong Kong SAR

MPhil in Individualized Interdisciplinary Program (Research Area) (IIP) - Artificial Intelligence (AI) — *Sept. 2021 - Jan. 2023*

- Awarded: Postgraduate Studentship Award (2021-2023).

Liverpool University

Liverpool, UK

B.S. in Electronic Science and Technology — *Sept. 2017 - July. 2021*

- Awarded a first class honors degree.

Xi'an Jiaotong-Liverpool University (XJTLU)

Suzhou, China

B.S. in Electronic Science and Technology — *Sept. 2017 - July. 2021*

- Awarded a first class honors degree.

Research Projects (10 projects were selected)

HKUST-DT System and Media Laboratory (SyMLab), MC2 Lab & APEX Team; *Supervisor: Prof. Pan Hui and Mingming FAN*

Exploring the Design of Meditation in Social VR for Romantic Partners

MC2 Lab & APEX Team, HKUST GZ

Project Leader & First Author — *July. 2022 - Oct. 2023*

- Meditations on love and kindness in VR offer a possible solution for long-distance couples, However, there are currently no suitable commercial applications for couples to engage in meditation activities while they are in a long distance.
- Organized a series of workshops with couples to build a prototype of a couple-preferred meditation VR app.
- It was presented at **2023 ACM Multimedia Conference (CCF - A)**.

Reducing Stress and Anxiety in the Metaverse: A Systematic Review of Meditation, Mindfulness and Virtual Reality

MC2 Lab & APEX Team, HKUST GZ

Project Leader & First Author — *May. 2022 - Nov. 2022*

- Meditation, or mindfulness, is widely used to improve mental health. However, to our knowledge, there are no guidelines and comprehensive reviews in the literature on how to conduct such research in virtual reality.
- Conducted a systematic literature review in the IEEE and ACM databases. Our process yielded 19 eligible papers and we conducted a structured analysis.
- It was presented at the **2022 Chinese CHI (ICACHI)** in November 2022.

The Dark Side of Augmented Reality: Exploring Manipulative Designs in AR

HKUST-DT System and Media Laboratory (SyMLab)

Function Implementation & First Author — *Mar. 2022 - Mar. 2023*

- Dark patterns, a malicious technique that influences users' personal behavioral decisions, are prevalent in websites and mobile applications, but little research has been done on the potential problems in AR environments.
- We used scenario construction to build our prototypes, we investigate the potential future approaches that dark patterns can have.
- We conducted a user study of the scenarios we constructed and discussed the impact of this malicious technique.
- The paper was published at the **International Journal of Human–Computer Interaction (IJHCI) (IF = 4.7, Q1)**.

Exploring How Virtual Reality Supports Remote Communication Between Grandparents and Grandchildren

APEX Team, HKUST GZ

Team Member — *May. 2022 - Mar. 2023*

- We identified grandparents' and grandchildren's preferences and visions for avatar appearance, interpersonal interaction, and shared activities to better support them in communicating with each other in VR.
- We derived and discussed design implications for designing VR to better facilitate intergenerational communication between grandparents and grandchildren.
- The paper was presented at the **2023 CHI Conference on Human Factors in Computing Systems (CCF - A)**.

Simulating Changes in Weight and Center of Gravity of Objects in Virtual Reality for Enhanced Realism

SyMLab, HKUST & XJTLU X-HCI Lab

Function Implementation & First Author — *Mar. 2021 - Jan. 2022*

- Participate in the overall research project to make innovations on previous scholars' devices. Designed portable devices based on special fluidic materials that can simulate changes in the mass and center of gravity position of visual objects in a visually realistic environment.
- Primarily responsible for hardware circuit design, hardware chaining implementation, the selection of fluid materials and the manufacture of special fluid materials, programming and algorithm design for the connection with the hardware and VR environment and the following debugging and algorithm improvement
- Finished experimental design, data analysis, research paper writing and the further improvement of the project subsequent follow-ups
- It was presented at the **2022 IEEE Haptics Symposium (HAPTICS)** in March 2022.

XJTLU Human-Computer Interaction Lab (X-HCI); *Supervisor: Prof. Hai-Ning Liang*

A Low-cost Device for Weight and Center of Gravity Simulation in Virtual Reality

X-HCI Lab, XJTLU, Suzhou

Researcher of Function Implementation & Co-author — *Jan. 2020 - Sept. 2021*

- Participated in the entire research project to design portable equipment that can simulate the change of visual object's quality and centre of gravity location under the visual reality environment
- Primarily responsible for hardware circuit design, hardware chaining implementation, programming and algorithm design for the connection with the hardware and VR environment and the following debugging and algorithm improvement
- Cooperated with others to finish experimental design, data analysis, research paper writing and the further improvement of the project subsequent follow-ups
- This research has been accepted by **23rd ACM International Conference on Multimodal Interaction (ICMI '21) (CCF - C)**

Study on how to use brain waves to control the difficulty of the game

X-HCI Lab, XJTLU, Suzhou

Responsible Person of Technology Implementation — *Sept. 2019 - Jan. 2020*

- Independently overcame the difficult problem of connecting the user's corresponding head skin with Open Source Biosensing Tools (OpenBCI) to gain the user's real-time brainwave signals accurately and then built the appropriate game environment in Unity
- Utilized Arduino to connect real-time brainwave signals with Unity to monitor the user's real-time brain waves and conducted deep learning when the user is playing VR games

Evaluating the Need and Effect of an Audience in a Virtual Reality Presentation Training Tool

X-HCI Lab, XJTLU, Suzhou

Experimenter and Data Analyst — *Jun. 2019 - Nov. 2019*

- Created realistic scenes by 3D scanners and conducted a further study on 12 participants with no VR experience
- Analyzed whether the virtual environment is better than no virtual reality system and whether it accepts the presence of virtual audience to verify our virtual environment
- Drew a conclusion that most users prefer to use virtual reality systems to improve their public speaking skills, rather than training in an empty environment. But preferences for audiences are mixed.

Study on the Effects of a Cartoon-Like Character with Emotions on Users' Behaviour within Virtual Reality Environments

X-HCI Lab, XJTLU, Suzhou

Experimental Researcher — *June. 2018 - Dec. 2018*

- Involved the preliminary literature review, VR game production and game character dubbing, and the entire VR environment construction
- Cooperated to do professional experiments, analyze experimental results and complete related research paper writing
- Concluded the research findings that cartoon characters could benefit from the emotional characteristics they exhibit when interacting with people in a virtual reality environment

Research on knee joint motion control method based on functional electrical stimulation

Soochow University and Joint Laboratory for China Space Applications

Research Fellow at the No.1 Technical Division — *June. 2020 - Oct. 2020*

- Focused on researching the rules of joint motion output under muscle stimulation and the influence of stimulus parameter changes on muscle output, and proposed a closed-loop control method combining feedforward control and PID feedback control based on the hill-Huxley inverse model to realize the knee joint motion control
- Mainly participated in the improved design of electric stimulation system based on the array electrode and implemented the muscle fatigue analysis under electric stimulation
- Conducted experimental research and method study on the knee joint motion control upon electrical stimulation

Work Experience

Suzhou Bio-engin Robot Technology Co. LTD *Suzhou, China*

Intern at the No. 1 Technical Division *Jun. 2020 - Sept. 2020*

- Completed the data reduction and preparing graphs in the Electromyography program.
- Self-studied TwinCAT 3 and fuzzy PID Control and managed to write PID MATLAB algorithm for the wire-driven parallel robot system applied to gait rehabilitation training.
- Engaged in modeling and verification pf knee joint motion under electric stimulation, supplemented some results of model verification based on experimental tests.
- Completed the final report titled Research on lower limb control based on FES.

Publication & Patent

[1] **Wang, X.**, Mo, X., Lee, L. H., Wei, X., Jin, X., Fan, M., & Hui, P. (2023, October). "Designing Loving-Kindness Meditation in Virtual Reality for Long-Distance Romantic Relationships". *In Proceedings of the 31st ACM International Conference on Multimedia (pp. 7608-7617).*

[2] Xiaoying Wei, Yizheng Gu, Emily Kuang, **Xian Wang**, Beiyan Cao, Xiaofu Jin, Mingming Fan. "Bridging the Generational Gap: Exploring How Virtual Reality Supports Remote Communication Between Grandparents and Grandchildren". *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems 1-15.* doi: `https://doi.org/10.1145/3544548.3581405`

[3] **Xian Wang**, Lik-Hang Lee, Carlos Bermejo Fernandez, Pan Hui. "The Dark Side of Augmented Reality: Exploring Manipulative Designs in AR". *International Journal of Human–Computer Interaction 1-16,* doi: `https://doi.org/10.1080/10447318.2023.2188799`

[4] **Xian WANG**, Xiaoyu MO, Mingming FAN, Lik-Hang LEE, Bertram SHI and Pan HUI. "Reducing Stress and Anxiety in the Metaverse: A Systematic Review of Meditation, Mindfulness and Virtual Reality". *Chinese CHI 2022.*

[5] **X. Wang**, D. Monteiro, L. Lee, P. Hui and H. Liang. "VibroWeight: Simulating Weight and Center of Gravity Changes of Objects in Virtual Reality for Enhanced Realism", *The 2022 IEEE Haptics Symposium (HAPTICS'22),* Santa Barbara, CA, USA, 2022. doi: `https://doi.org/10.1109/HAPTICS52432.2022.9765609`

[6] D. Monteiro, H. Liang, **X. Wang**, W. Xu and H. Tu, "Design and Development of a Low-cost Device for Weight andCenter of Gravity Simulation in Virtual Reality", *in 23rd ACM International Conference on Multimodal Interaction (ICMI '21),* Montreal, Canada, 2021. doi: `https://doi.org/10.1145/3462244.3479907`

[7] D. Monteiro, **X. Wang**, H. -N. Liang and Y. Cai, "Spatial Knowledge Acquisition in Virtual and Physical Reality: A Comparative Evaluation," *2021 IEEE 7th International Conference on Virtual Reality (ICVR), 2021*, pp. 308-313, doi: `https://doi.org/10.1109/ICVR51878.2021.9483809`

[8] D. Monteiro, H. Liang, H. Li, Y. Fu and **X. Wang**, "Evaluating the Need and Effect of an Audience in a Virtual Reality Presentation Training Tool", *in Computer Animation and Social Agents, CASA 2020,* Bournemouth, UK, 2020, pp. 62-70, doi: `https://doi.org/10.1007/978-3-030-63426-1_7`

[9] D. Monteiro, H. Liang, J. Wang, L. Wang, **X. Wang** and Y. Yue, "Evaluating the Effects of a Cartoon-Like Character with Emotions on Users' Behaviour within Virtual Reality Environments," *2018 IEEE International Conference on Artificial Intelligence and Virtual Reality (AIVR), 2018,* pp. 229-236, doi: `https://doi.org/10.1109/AIVR.2018.00053`

[10] **Patent:** A new device and method for simulating weight and center of gravity in a virtual reality environment Patent Application No.: 202010885890. (28/08/2020)

Professional Services

2022 **Program Committees Members,** ISMAR 22 *Singapore*

2023 **Web Chair,** Mobisys 23 *Las Vegas, U.S.A*

2022-23 **Reviewer,** CHI 22, CSCW 23 and MM 23

2023 **Reviewer,** Cyberpsychology, Behavior, and Social Networking (**IF = 6.6, Q1**)

Teaching Experiences

2022-23 **Teaching Assistant,** CMAA 5017: AR/VR/MR/XR: Concepts, Theory and Techniques *HKUST, Hong Kong*

Honors & Awards

2023	**Research Travel Grant**, HKD 13500	*HKUST, Hong Kong*
2018-21	**President**, Xi'an Jiaotong-Liverpool University Student-Staff Liaison Committee	*Suzhou, China*
2018-19	**Marketing Manager**, Xi'an Jiaotong-Liverpool University G-Master Robot Design Team	*Suzhou, China*
2018-19	**3rd Prize**, RoboMaster 2019 International Regional Competition	
2018-19	**Vice President**, Xi'an Jiaotong-Liverpool University Physics Club	*Suzhou, China*
2017-18	**Third Prize, *Group Leader***, 1st Interdisciplinary Social Innovation Program, XJTLU ILEAD	*Suzhou, China*
2017-18	**Volunteer Excellent Award**, Outstanding Dedication and Support for XJTLU	*Suzhou, China*

Skills

Professional Skills	C/C++/C#, LaTeX, Unity, Assembly, MATLAB, VB, Python, Verilog, Tanner, photoshop, 3Dmax, TwinCAT
Languages	Chinese, English
Hobbies	Piano (Level 10), Ukulele, Painting (Oil and Watercolor), Latin