Liu, Zhe

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EDUCATION

PhD of Computer Science, Human-Computer Interaction and Human-AI Interaction — Vancouver, Canada
University of British Columbia — Sep. 2022 - Present
Supervisor: Joanna McGrenere
Awards: Four Year Doctoral Fellowship (4YF)

Master of Science, Human-Computer Interaction (GPA 3.70 /4.0) — Waterloo, Canada
University of Waterloo — May. 2017 - Aug. 2019
THESIS - *Modeling Cumulative Arm Fatigue on Large Multi-touch Displays* [Thesis]
(Advisors: Prof. James Wallace, Prof. Daniel Vogel)
Relevant Courses: Computer Vision in Human-Computer Interaction, Machine Learning, Deep Learning

Bachelor of Science, Industrial Engineering (GPA 3.65 / 4.0) — Beijing, China
Tsinghua University — Sep. 2011 - Jul. 2015
Relevant Courses: Programming, Data Structures, Algorithm Analysis, Databases, User-Centered Design

RESEARCH EXPERIENCE

Enhancing Semi-Structured Interviews with AI-driven Interview Assistant — Canada
University of British Columbia, Multimodal User eXperience group — Sep. 2022 - Present

- Performed literature review on Human-CA collaboration, and semi-structured interview for user study
- Conducted a 2-session need-finding study with 9 researchers on experience with semi-structured interviews and desired supports from AI-driven interview assistants
- Summarized the paramilitary findings as concrete implications for the design of AI-driven Interview Assistant

Interacting with Remote Smart Devices with Hand-held Controllers in Smart Home Environment — Canada
Huawei Technologies Canada, Human-Machine Interaction Lab — Sep. 2020 - Dec. 2021

- Conducted literature review on pointing selection with smartphone and air mouse, and generated an internal report
- Designed the interaction including state diagram and transfer function, and implemented the high-fidelity demonstration
- Carried out an evaluation experiment with 30 participants with Fitts' Law protocol, and confirmed design parameters for hand-held controllers' hardware and software design
- Summarized the system designs into 2 patents, with the interaction design approved for the next generation products

A Fatigue Estimation Toolkit for Fatigue-Aware Interface for Large Touch Display [Paper] — Canada
University of Waterloo, Human-Computer Interaction Lab — Jun. 2017 - Apr. 2019

- Built a Fitts´ Law experiment interface for touchscreen with body-tracking
- Generated and evaluated a toolkit for estimating real-time arm fatigue during large-display interaction

A Tablet-based System to Facilitate Visitor Interaction with People with Dementia [Paper] [Video] — Singapore
National University of Singapore, NUS-HCI LAB — Oct. 2015 - May. 2016

- Developed a tablet-application recommendation framework to nursing home visitors
- Implemented a cross-platform profile management system for residents and visitors
- Conducted contextual interviews with visitor-resident pairs and evaluated their engagement

A Motion-based Tetris Game to Engage Students with Autism in Classroom Settings [Video] — United State
Georgia Institute of Technology, School of Interactive Computing — Jun. - Sep. 2014

- Designed and developed a motion-based Tetris game with **C#**
- Managed an observational study with 30 students with autism and interviews with 7 teachers and caregivers to test the impact on childrenś engagement, social behaviour and motor skills

An Online Instructive Platform for Self-Motivated Hand Rehabilitation [Paper][Video] — China
Tsinghua University, Human Factors Engineering Lab (HFEL) — Aug. 2012 - Jun. 2014

- Collaborated with a general hospital and interviewed 5 rehabilitation therapists for platform demand
- Established a hand rehabilitation platform with a gesture comparison function, which supports instant feedback, a record of recovery, and therapists' remote instructions

PUBLICATIONS

Papers

- **Zhe, Liu**, Daniel Vogel, and James R Wallace. Applying the cumulative fatigue model to interaction on large, multi-touch displays. In *Proceedings of the 7th ACM International Symposium on Pervasive Displays*, page 1. ACM, 2018. `doi:https://doi.org/10.1145/3205873.3205890`
- Pin Sym Foong, Shengdong Zhao, Kelsey Carlson, and **Zhe, Liu**. Vita: Towards supporting volunteer interactions with long-term care residents with dementia. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, pages 6195–6207. ACM, 2017. `doi:https://doi.org/10.1145/3025453.3025776`
- **Zhe, Liu**, Yingzhi Zhang, Pei-Luen Patrick Rau, Pilsung Choe, and Tauseef Gulrez. Leap-motion based online interactive system for hand rehabilitation. In *International Conference on Cross-Cultural Design*, pages 338–347. Springer, 2015. `doi:https://doi.org/10.1007/978-3-319-20934-0_32`
- **Zhe, Liu**, Chen Liao, and Pilsung Choe. An approach of indoor exercise: Kinect-based video game for elderly people. In *International Conference on Cross-Cultural Design*, pages 193–200. Springer, 2014. `doi:https://doi.org/10.1007/978-3-319-07308-8_19`

Patents (Granted)

- *Application No. 202111166702.3*
  A Method of Automatically Detecting Headphone Wearing Condition *(2021 Aug)*
- *Application No. 17343410*
  Build a Flexible Local Tracking System Using One or Multiple Mobile Devices *(2020 Jul)*
- *Application No. WO2022027435A1*
  Activating Cross-Device Interaction with Pointing Gesture Recognition *(2020 Jun)*
- *Application No. 202010935439.9*
  A Bi-manual Separated Text Entry Method Based on Stroke Direction and Distance *(2020 May)*
- *Application No. 202011376728.6*
  A Low-Energy-Consumption Method for Multi-Device Position Detecting and Updating *(2020 May)*

WORK EXPERIENCE

HCI Research Engineer   Markham, Canada
HUAWEI Technologies Canada   May. 2019 - Aug. 2022
- Designed and evaluated a bi-manual text entry method with 'eyes-free' situation for VR display
- Conducted experiment about free-hand gesture control with large distant display
- Investigated user behavior for pointing with IMU and UWB-driven devices in a real Smart Home environment

Full Stack Developer   Toronto, Canada
Ecopia Tech   May. - Aug. 2018
- Developed a web-based interface using REACT (**JavaScript** library) for stage-able project management
- Implemented a distributive system with **AWS** to pipeline programs, decreasing human effort by 92%

Research Assistant   Singapore
National University of Singapore, NUS-HCI LAB   Oct. 2015 - May. 2016
- Investigated the impact of tablet applications on the engagement of residents in nursing home
- Developed a haptic wristband that encodes information into spatiotemporal vibrations with Arduino

Research Intern   Atlanta, United States
Georgia Institute of Technology, Ubiquitous Computing Group   Jun. - Sep. 2014
- Explored the impact of motion-based activities on the social behavior of students with autism