Ziwei (Zoe) Liu

Chicago, IL | 919-935-8828 | ziweiliu@uchicago.edu | https://zoelzw.github.io

Education

M.S. Computer Science, Pre-doctoral Program Oct. 2019 – present
University of Chicago | Advisor: Pedro Lopes | Merit Scholarship $27500

B.S. Electrical Engineering, Control Systems Concentration Aug. 2016 – May 2019
North Carolina State University | Advisor: He Helen Huang | Dean's List all semesters

Publications And Presentations

1. HandMorph: a Passive Exoskeleton that Miniaturizes Grasp
Jun Nishida, Soichiro Matsuda, Hiroshi Mastsui, Shan-yuan Teng, **Ziwei Liu**, Kenji Suzuki, and Pedro Lopes. **UIST Best Paper Award** Link to Paper | Link to Video
ACM UIST User Interface Software and Technology Symposium, 2020

2. Gaze Fixation Comparisons Between Amputees and Able-bodied Individuals in Approaching Stairs and Level-ground Transitions: A Pilot Study Link to Paper
Minhan Li, Boxuan Zhong, **Ziwei Liu**, I-Chieh Lee, Bretta L. Fylstra, Edgar Lobaton and He Helen Huang.
IEEE EMBC 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2019

3. **Abstract and Poster**: HoloLens-based Augmented Reality Obstacle Avoidance Training Has Varying Impact on Individuals' Obstacle Avoidance Strategies
Ziwei Liu, Stephanie Huang, Ming Liu, He Helen Huang.
BMES Biomedical Engineering Society Annual Meeting, 2018

4. **Abstract and Poster**: Influence of Experience on Eye Gaze Patterns and Identification of Normative Gait from Biological Motion
I-Chieh Lee, Matheus Maia Pacheco, **Ziwei Liu**, He Helen Huang.
ICOPA International Conference On Patient Advocacy, 2019

Research Experiences

Pre-doctoral Research Assistant Oct. 2019 – Present
University of Chicago | Human Computer Integration Lab

- leading a project to build wearables that improve the usability of Electrical Muscle Stimulation by minimizing discomfort in preparations for submission to *ACM UIST 2021*
- Developed a novel wearable creating haptic illusions in preparations for submission to *ACM UIST 2021*
- Led user studies to evaluate the usability of HandMorph, an exoskeleton that miniaturizes grasp in designing products for children and co-edited the paper published in *ACM UIST 2020*
- Engineered and explored a wearable device with touch sensing and vibrotactile actuation based on a neuroscience principle for a future submission
- Organized a reading group reviewing literature in Embodiment and a guest talk on EMG-based Human-Machine Interface to promote discussions and brainstorms about emerging technologies and techniques in HCI/HMI
- Facilitated Ada Lovelace Week online events to celebrate gender diversity in technology and uplift the impact of women and no-binary technologists

Undergraduate Research Assistant Jan. 2018 – May 2019
NC State University & UNC Chapel Hill |Neuromuscular Rehabilitation Engineering Laboratory

- Identified gaze differences between amputees and able-bodied people in terrain transitions using Tobii Pro Eye Tracking Glasses and published findings in *Conference of the IEEE Engineering in Medicine and Biology Society*
- Initiated an independent study examining able-bodied people's obstacle avoidance strategies in Microsoft HoloLens-based Mixed Reality environments made in Unity compared to physical obstacle training course and presented results in *2018 Biomedical Engineering Society Annual Meeting*
- Conducted three experiments with over 50 human subjects including 6 amputees and collected full-body biomechanical data using Vicon motion capture system for future motion analysis studies
- Built a differential muscle sensor PCB using Altium for microcontroller applications

Battery Technician June 2017 – May 2018

NC State University | SolarPack solar car team

- Collaboratively developed charging-battery-motor loop for a 4-seater solar-powered vehicle
- Represented the team in 2017 American Solar Challenge, Austin, TX

Selected Awards

ACM User Interface Software and Technology Symposium (UIST) Best Paper Award 2020

NC State University DiamondHacks Hackathon Best Overall Prize 2018

NC State Sustainability Innovation Challenge Make-A-Thon Best Social Media Prize 2018

NC State University Undergraduate Research Grant 2018

NC Triangle VR Hackathon Best Visual Design Prize 2017

Teaching and Leadership Experiences

Electrical Engineering Ambassador Jan. 2018 – May 2019

North Carolina State University

- Led monthly group tours in the ECE department and College of Engineering for visiting students and scholars
- Organized departmental events, including outreach events, academic advising, and trainings in the Maker-space

Teaching Assistant Jan. 2018 – May 2018

North Carolina State University

- Administered weekly problem sessions for 35 sophomores in Electrical and Computer Engineering demonstrating analysis and design of circuits (ECE 211)
- Assisted instructors in test preparation, project evaluations, and office hours

Tutor of Calculus I, II, and III & University Physics I and II Jan. 2018 – May 2019

North Carolina State University

- Tutored and mentored 11 undergraduate students both individually and in a group setting on a weekly basis
- Coached tutees to become independent learners and greatly improved their learning habits and grades

Professional Experiences

Engineering Fellow 2020 Summer

Open Style Lab

- Collaborated with designers, occupational therapists, and co-designers with physical disabilities from the Muscular Dystrophy Association in inventing clothing hacks for accessible dressing and usability tests
- Developed a full-stack web application analyzing existing accessible clothing framework around the world using Google Apps Script and PostgreSQL

Engineering Entrepreneur Aug. 2018 – May 2019

North Carolina State University

- Co-designed an IoT system to monitor and secure intravenous therapy for patients with mental disorders
- Constructed a wearable medical device with access control using Radio-frequency identification (RFID) and customized mechanical chamber

Electrical Engineering Intern 2016 Summer

State Grid Corporation of China

- Assisted senior engineers with administrative work in Power Management Center and maintained consistent updates and reports of electricity usage in Nanyang City

Technical SKILLS

Software: Programming (`C#`, Python, Go, C, SQL, HTML/CSS, Assembly, Verilog, MATLAB), Signal Processing, Mixed Reality Design, Video/Audio Editing(Adobe Premiere Pro, Photoshop, Illustrator), Basic Machine Learning
Hardware: Circuit and PCB design, Microcontrollers, Control systems design, Embedded systems, Product Prototyping and Digital Fabrication(3D Modeling and Printing, Laser Cutting, Sewing, Silicone Molding)