Shih-Yu (Leo) Ma

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About Shih-Yu

With a dual major in Electrical Engineering and Design, I am a dedicated researcher, a responsible team player, and an explorer in HCI with an insatiable curiosity. I am now embarking on my next academic journey.

- Research Interests: *Explainable AI*, *Extended Reality*, *Human-Computer Interaction*, *Cognitive Science*, and *Tangible Experience*.

Education

University of Colorado Boulder
PhD in Computer Science

- Advisor: Prof. Tom Yeh and Ellen Do
- Research Area: Explainable AI / Extended Reality / Human-Computer Interaction

National Taiwan University of Science and Technology
Master in Information Design

- Advisor: Prof. Neng-Hao Yu
- **Thesis:** Reducing Cybersickness in Virtual Reality Driving Experiences Using a Head-Mounted Vibrational Feedback Device (Co-advisor: Prof. Mike Y. Chen)
- GPA: 4.07

National Taiwan University of Science and Technology
Bachelor of Science & Design

- **Double Major:** Electrical Engineering and Industrial Design
- GPA: 3.31

Experience

Visiting Researcher
University of Colorado Boulder, Center for the Brain, AI, and Child, CO

- Developed an MR driving warning system using **Unity** and conducted cognitive behavior measurements through **fNIRS** in a 30-minute study design.
- Spearheaded a haptic project in **Python** and **Arduino** to assist individuals with visual impairments by translating brain activity into vibrotactile feedback. Conducted interviews and presented a prototype demonstration.

Graduate Research Assistant
National Taiwan University of Science and Technology, Intelligent User Interfaces (IUI) Lab, TW

- Developed a haptic experience using **Unity** and **Arduino** to enhance VR driving simulations.
- Reduced the device's weight by 80% and volume by 70% through innovative design and customized PCB integration.
- Enhanced realism, immersion, and enjoyment with statistically significant improvements ($p < .01$) across three prototype phases involving 70 participants.
- Redesigned hardware maintenance processes by conducting 20 on-site interviews and digitizing over 1000 paper-based instructions.

Mixed Reality Developer
Corma New Media, TW

- Created an AR hardware maintenance application compatible with **Hololens, iPad, and Android tablets**, featuring interactive step-by-step guidance, a device catalog database, and object tracking.
- Designed a VR career experience application for individuals with disabilities in collaboration with the New Taipei City government and conducted training sessions for instructors.
- Engineered an MR driving assistance system for bus drivers, earning both the People's Choice and Best

Presentation Awards among 52 projects.

Publications

Investigating the Effects of Limited Field of View on Jamming Experience in Extended Reality.

Suibi Che-Chuan Weng, Torin Hopkins, ***Shih-Yu Ma***, Chad Tobin, Amy Banic, and Ellen Yi-Luen Do

IEEE ISMAR-Adjunct
DOI: 10.1109/ISMAR-Adjunct60411.2023.00107

DrivingVibe: Enhancing VR Driving Experience using Inertia-based Vibrotactile Feedback around the Head.

Neng-Hao Yu, ***Shih-Yu Ma***, Cong-Min Lin, Chi-Aan Fan, Luca E. Taglialatela, Tsai-Yuan Huang, Carolyn Yu, Yun-Ting Cheng, Ya-Chi Liao, and Mike Y. Chen

ACM MobileHCI
DOI: 10.1145/3604253

Exploring Mixed-Reality for Enhancing Driver Warning Systems: A Preliminary Study on Attention-Shifting Methods and Hazard Perception.

Shih-Yu Ma, Nolan Robert Brady, Xu Han, Neng-Hao Yu, and Tom Yeh

ACM AutoUI
DOI: 10.1145/3581961.3609868

InertiaVibe: Low-fidelity Simulation of Inertia using Head-mounted Vibrotactile Feedback to Reduce Cybersickness and Enhance VR Experience.

Shih-Yu Ma, Cong-Min Lin, Chung-Wei Wang, Neng-Hao Yu, and Mike Y. Chen

ACM UbiComp/ISWC
DOI: 10.1145/3544793.3561319

Exploring the Experience of Traveling to Familiar Places in VR: An Empirical Study Using Google Earth VR.

Peng-Kai Hung, Rung-Huei Liang, ***Shih-Yu Ma***, and Bo-Wen Kong

International Journal of Human–Computer Interaction
DOI: 10.1080/10447318.2022.2114141

Teaching

Graduate Teaching Assistant
University of Colorado Boulder, CO

- **CSCI2270 Data Structures:** Developed instructional materials to clarify data structure concepts, designed assignments and projects, and held regular office hours.

Graduate Teaching Assistant
National Taiwan University of Science and Technology, TW

- **DT2634 Creative Programming:** Assisted students with Processing, graded assignments using a customized GitHub Classroom system, and hosted office hours.
- **DT5423 Interactive Storytelling in Mixed Reality:** Supported Unity development, curated a final demo exhibition for over 100 participants, and hosted office hours.

Volunteering

Chair
OpenHCI2021 Workshop

- Organized a student-led workshop to foster Human-Computer Interaction and interdisciplinary collaboration.
- Coordinated with institutions including the American Innovation Center and the American Institute in Taiwan.
- Led a team of 53 members, engaging 40 participants and attracting over 500 viewers at the final exhibition.
- Oversaw teams for speech hosting, HR, IT, and photography.

Technical Teaching Assistant
OpenHCI2021 Workshop

- Guided participants through the Double Diamond ideation model.
- Provided hardware and software support, including 3D printing, laser cutting, and carpentry.
- Contributed to winning the Best Technical Award among five projects.

Honors & Awards

5G+ Industry Rising Stars Set Sail Scholarship
Taiwan Institute for Information Industry

Full-time Graduate Research Scholarship
National Taiwan University of Science and Technology Design Department

Young Pin Design Award in Social Design
Taiwan Design Research Institute

- **Parallel Vacation** – Industrial design graduation project

Technologies

Languages: C++, C, C#, Python, R, Matlab

Hardware: Arduino, ESP32, Circuit Design