Amber Hsiao-Yang Chou

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I am a Ph.D. student at the University of Washington, Seattle focusing on **improving the *accessibility*, *robustness*, and *usability* of human-computer/-machine interfaces**. My research interest lies in the intersection of bioengineering and electrical & computer engineering. My proposed Ph.D. research leverages theoretical techniques from control theory, game theory, and sensorimotor control to synthesize co-adaptive multimodal interfaces, and makes progress toward feasible and inclusive human-computer/-machine interfaces.

EDUCATION

University of Washington, Seattle | Ph.D. in Electrical & Computer Engineering Seattle, WA | 2020 - Present
Advisor: Samuel A Burden
Concentration: Human-Machine Interfaces, Control Theory, Sensorimotor Control

University of California, Davis (UC Davis) | M.S. in Biological Systems Engineering Davis, CA | 2018 - 2020
Advisor: Farzaneh Khorsandi | GPA: 3.94/4.00
Thesis: Develop an Autonomous All-Terrain Vehicle for Rollover Simulation

University of California, Davis (UC Davis) | B.S. in Biological Systems Engineering Davis, CA | 2014 - 2018
GPA: 3.73/4.00

RESEARCH EXPERIENCE

University of Washington | Graduate Research Assistant Seattle, WA | Sep. 2020 – Present

- Advisors: Samuel A. Burden
- Research focus: human-computer/-machine interfaces, control theory, sensorimotor control
- Thesis (proposed): Co-adaptive Multimodal Human/Machine Interfaces
  - Evaluate combination of sensorimotor pathways in multimodal human/machine interfaces [P5]
  - Conduct human subject experiments to evaluate novel human/machine interfaces [P3]
  - Synthesize multibehavioral legged robot using multi-objective optimization
- Poster Presentation at UW WomXn at the Forefront of ECE Research (Dec 2021)
  Optimally Combine Sensorimotor Pathways in Human-Machine Task with Multiple Sensory Modalities

UC Davis Machine Systems Lab | Graduate Research Assistant Davis, CA | May 2018 – Sep. 2020

- Advisors: Farzenah Khorsandi
- Research focus: biosystems, control theory, agricultural robotics
- Thesis: Develop an Autonomous All-Terrain Vehicle for Rollover Simulation [P2 & P1]
  - Developed a navigation and steering system for the autonomous ATV based on GPS RTK technology and image processing using Robotic Operation System (ROS) and OpenCV.
  - Collaborated in over 5 projects, including developing the first ATV safety test station in the US, designing an ATV rollover simulator, and designing a new chemical spraying system for orchards.
- Presented at the American Society of Agricultural and Biological Engineers (ASABE) Conference 2019 & 20
  Developing and Testing a GPS-Based Steering Control System for an Autonomous All-Terrain Vehicle

USDA APHIS Capstone Project | Undergraduate Researcher Davis, CA | Dec. 2017 – June 2018

- Cooperated with USDA Animal and Plant Health Inspection Service (APHIS) to develop a novel solution of semi-autonomous temperature monitoring system of large-scale poultry compost windrows.
- Successfully designed, built, and evaluated a scaled prototype with real-time temperature data acquisition ability, which was presented in the UC Davis Engineering Senior Design Showcase 2018.
- Skilled interpersonal communicator, managing the team in both one-on-one and group settings.

PUBLICATIONS

P5. **Chou AHY**, Yamagami M, Burden SA. Evaluating a Human/Machine Interface with Redundant Motor Modalities for Trajectory-Tracking. *Submitted to IFAC Workshop on Cyber-Physical Human Systems 2022*.

P4. Peterson LN, **Chou AHY**, Burden SA, Yamagami M. Predictive Model of EMG and Manual Interfaces for Human Machine Interaction. *Submitted to IFAC Workshop on Cyber-Physical Human Systems 2022*.

P3. Yamagami M, Madduri M, Chasnov B, **Chou AHY**, Peterson LN, Burden SA. Co-Adaptation for Human-in-the-Loop Control Systems. *In Preparation*.

P2. **Chou, H. Y.**, Khorsandi, F., Vougioukas, S. G., Fathallah, F. A. Developing and evaluating an autonomous agricultural all-terrain vehicle for field experimental rollover simulations. *Computers and Electronics in Agriculture*. 2022. (Vol.194, p. 106735). | Link

P1. **Chou, H. Y.**, Khorsandi, F. Developing and Testing a GPS-Based Steering Control System for an Autonomous All-Terrain Vehicle. *2020 ASABE Annual*. 2020. | Link

TEACHING

Engineering Design and Communication | Teaching Assistant Davis, CA | Fall 2019

- Organize and teach undergraduate engineering design and communication labs, studios, and office hours.
- Assist in organizing the engineering showcase for undergraduate students.

Engineering Economics | Teaching Assistant Davis, CA | Winter 2019, 2020

- Assist in teaching undergraduate engineering economics class with 80+ students.
- Organize office hours and provide guidance in students' class projects.

Classical Physics | Lab Teaching Assistant Davis, CA | Spring 2019

- Teach four undergraduate physics labs with a total of 80 students.

INTERNSHIP

TacSense Inc. | Sensor Engineering Intern Woodland, CA| Feb. 2016 - June 2018

- Mentors: Ben Bazor, Prof. Tingrui Pan
- Managed the creation and execution of a calibration and testing station for biomedical pressure sensor prototypes, including shop work such as electronic prototyping, woodworking, and metalworking.
- Developed CAD designs for demonstration, documentation, and rapid prototyping.
- Integrated sensors into wearable products and assisted in modeling prototypes for various applications.
- Troubleshooted production issues in two research and development projects including fluid pressure and material strength analysis.

HONORS & AWARDS

UC Davis Bio & Ag Engineering Graduate Student Researcher Fellowship	2018 - 2020
UC Davis Peter J. Shields and Henry A. Jastro Research Award	2019-2020
UC Davis Jastro-Shields Travel Award	2018
Robert Roy Owen Scholarship & Howard R. Murphy Scholarship	2017 - 2018
UC Davis Dean's Honor List in College of Engineering	2015, 16, 18

MENTORING & SERVICE

UW ECE Biorobotics Lab
Mentored undergraduate student Lauren Peterson [P4] — Seattle, WA | Winter - Spring 2021

UW ECE Graduate Application Support Program
Mentored three student applicants — Seattle, WA | Fall 2021

UW Center for Neurotechnology Research
Mentored undergraduate student Alexis Blakes — Seattle, WA | Summer 2021

REFERENCES

Samuel A. Burden
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Farzaneh Khorsandi
Assistant Professor of Cooperative Extension in Biological and Agricultural Engineering
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