Yi-Chi Liao

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SUMMARY

Fellowship Postdoc Researcher at SIP Lab (led by Prof. Christian Holz) at ETH Zürich. I research in:

- **Modeling Human Motions via Deep Reinforcement Learning:** Modeling, understanding, and simulating human motions when using interactive systems within physics simulations [9, 11, 13].
- **Advancing Human-in-the-Loop Optimization & Human-AI Interaction:** Integrating advanced machine learning techniques into optimization methods, assisting the designers' decision-making [8, 9, 10, 12], achieving real-time interface adaptation [14, 15], and fostering effective human-AI interactions [16, 17].
- **Building Novel Interactions:** Input & sensing techniques [1, 5, 6, 7, 8, 14], haptic displays [2, 3, 6, 7, 15], AR/VR interactions [4, 10, 13, 14], and computational design tools [9, 12, 15, 16, 17].

RESEARCH EXPERIENCES

ETH Zürich, Zürich, Switzerland.

- Postdoctoral Research Fellow. — Jun 2024 – Now
  - Supervisor: Prof. Christian Holz.
  - Fully funded (250k CHF) by the ETH Zürich Postdoc Fellowship Programme.

Saarland University, Saarbrücken, Germany.

- Postdoctoral Researcher. — Nov 2023 – May 2023
  - Supervisor: Prof. Jürgen Steimle and Prof Anna Feit.

Meta Reality Labs Research, Redmond, Washington, U.S.A.

- Research Intern. — May 2022 – Oct 2022
  - Supervisor: Dr. Aakar Gupta.
  - Collaborators: Dr. Ruta Desai, Dr. Tanya Jonker, and Dr. Hrvoje Benko.

EDUCATION

Aalto University, Helsinki, Finland

- Ph.D. in School of Electrical Engineering — May 2018 – Dec 2023
  - Dissertation: Human-in-the-Loop Design Optimization
  - Adviser: Dr. Antti Oulasvirta
  - Opponent: Dr. Pedro Lopes

National Taiwan University, Taipei City, Taiwan

- M.B.A. in Information Management — Sep 2014 – Jun 2017
  - Thesis: Effective Character Output Using a Wrist-Worn Tactile Display
  - Advisor: Dr. Bing-Yu Chen and Dr. Liwei Chan.
- B.B.A. in Information Management — Sep 2010 – Jun 2014

PUBLICATIONS

JOURNAL PAPERS

[17] Yi-Chi Liao*, George B. Mo*, John J. Dudley, Chun-Lien Cheng, Liwei Chan, , Antti Oulasvirta, and Per Ola Kristensson, "Practical approaches to group-level multi-objective Bayesian optimization in interaction technique design," in *Proceedings of the Collective Intelligence 2024*. (* authors contribute equally.)

[16] George B. Mo, John J. Dudley, Liwei Chan, Yi-Chi Liao, Antti Oulasvirta, and Per Ola Kristensson, "Cooperative Multi-Objective Bayesian Design Optimization," in *Proceedings of the ACM Transactions on Interactive Intelligent Systems 2024*.

[15] Yi-Chi Liao, John J. Dudley, George B. Mo, Chun-Lien Cheng, Liwei Chan, Antti Oulasvirta, and Per Ola Kristensson, "Interaction Design With Multi-objective Bayesian Optimization," in *Proceedings of the IEEE Pervasive Computing 2023*, Jan 2023.

CONFERENCE PAPERS & EXTENDED ABSTRACTS

[14] Yi-Chi Liao, Ruta Desai, Alec M. Pierce, Krista E. Taylor, Hrvoje Benko, Tanya R. Jonker, and Aakar Gupta, "A Meta-Bayesian Approach for Rapid Online Parametric Optimization for Wrist-based Interactions," in *Proceedings of the CHI 2024*, Honolulu, Hawai'i , May 2024. (Acceptance rate = 26.3%)

[13] Hee-Seung Moon, Yi-Chi Liao, Chenyu Li, Byungjoo Lee, and Antti Oulasvirta, " Real-time 3D Target Inference via Biomechanical Simulation ," in *Proceedings of the CHI 2024*, Honolulu, Hawai'i , May 2024. (Acceptance rate = 26.3%). **Honorable Mention Award**.

[12] Lena Hegemann, Yue Jiang, Joon-Gi Shin, Yi-Chi Liao, Markku Laine, and Antti Oulasvirta, "Computational Assistance for User Interface Design: Smarter Generation and Evaluation of Design Ideas," in *Proceedings of the CHI 2023 Adjunct*, Hamburg, Germany, May 2023.

[11] Yi-Chi Liao, Kashyap Todi, Aditya Acharya, Antti Keurulainen, Andrew Howes, and Antti Oulasvirta, "Rediscovering Affordance: A Reinforcement Learning Perspective," in *Proceedings of the CHI 2022*, New Orleans, Louisiana, Apr 2022. (Direct acceptance rate = 12.5%)

[10] Liwei Chan, Yi-Chi Liao, George B. Mo, John J. Dudley, Chun-Lien Cheng, Per Ola Kristensson, and Antti Oulasvirta, "Investigating Positive and Negative Qualities of Human-in-the-Loop Optimization for Designing Interaction Techniques," in *Proceedings of the CHI 2022*, New Orleans, Louisiana, Apr 2022. (Direct acceptance rate = 12.5%). **Honorable Mention Award**.

[9] Yi-Chi Liao, "Computational Workflows for Designing Input Devices," in *Proceedings of the CHI 2021 Adjunct*, Yokohama, Japan, May 2021. (Acceptance rate = 21.7%)

[8] Yi-Chi Liao, Sunjun Kim, Byungjoo Lee, and Antti Oulasvirta, "Button Simulation and Design via FDVV Models," in *Proceedings of the CHI 2020*, Honolulu, HI, May 2020. (Acceptance rate = 24.3%)

[7] Yi-Chi Liao, Sunjun Kim, Byungjoo Lee, and Antti Oulasvirta, "Press'Em: Simulating Varying Button Tactility via FDVV Models," in *Proceedings of the CHI 2020 Adjunct*, Honolulu, HI, May 2020.

[6] Yi-Chi Liao, Sunjun Kim, and Antti Oulasvirta, "One Button to Rule Them All: Rendering Arbitrary Force-Displacement Curves," in *Proceedings of the UIST'18 Adjunct*, Berlin, Germany, Oct 2018.

[5] Yi-Chi Liao, Yen-Chiu Chen, Liwei Chan, and Bing-Yu Chen, "Dwell+: Multi-Level Mode Selection Using Vibrotactile Cues," in *Proceedings of the UIST'17*, Québec City, QC, Canada, Oct 2017. (Acceptance rate = 22%)

[4] Yung-Ta Lin, Yi-Chi Liao, Shan-Yuan Teng, Yi-Ju Chung, Liwei Chan, and Bing-Yu Chen, "Outside-In: Visualizing Out-of-Sight Regions-of-Interest in a 360° Video Using Spatial Picture-in-Picture Previews," in *Proceedings of the UIST'17*, Québec City, QC, Canada, Oct 2017. (Acceptance rate = 22%)

[3] Yi-Chi Liao, Yi-Ling Chen, Jo-Yu Lo, Rong-Hao Liang, Liwei Chan, and Bing-Yu Chen, "EdgeVib: Effective Alphanumeric Character Output Using a Wrist-Worn Tactile Display," in *Proceedings of the UIST'16*, Tokyo, Japan, Oct 2016. (Acceptance rate = 20%)

[2] Yi-Chi Liao, Shun-Yao Yang, Rong-Hao Liang, Liwei Chan, and Bing-Yu Chen, "ThirdHand: wearing a robotic arm to experience rich force feedback," in *Proceedings of the Siggraph Asia'15 Emerging Techonology*, Kobe, Japan, Nov 2015. (Acceptance rate = 30%)

[1] Chin-Yu Chien, Cheng-Yuan Li, Liwei Chan, Yi-Chi Liao, Rong-Hao Liang, Hao-Hua Chu, and Bing-Yu Chen, "fStrip: a malleable shape-retaining wearable strip for interface on-demand," in *Proceedings of the UbiComp/ISWC'15 Adjunct*, Osaka, Japan, Sep 2015.

AWARDS & FELLOWSHIP

- ETH Zürich Postdoctoral Fellowship. Jan 2024
  - Postdoctoral research funding (250K CHF).
- Paper Award. May 2024
  - Honorable Mention Award at ACM CHI 2024 [13] and ACM CHI 2022 [10].
- ACM CHI '21 Doctoral Consortium. May 2021
  - Topic: Computational Workflows for Designing Input Devices
  - 10 doctoral candidates were accepted out of 46 submissions.
- Special Recognitions for Outstanding Reviews.
  - 2 x recognitions for CHI 2024 LBWs.
  - 1 x recognitions for UIST 2022 Papers.
  - 3 x recognitions for CHI 2021 Papers.
  - 1 x recognitions for CHI 2020 Papers.
- Best Implementation Award, Student Innovation Competition, UIST'16. Oct 2016

EMS Air Guitar, US$ 1,000 award.

- The Most Innovative Demo, HackNTU 2014. Jun 2014
  Interactive chair for detecting sitting posture, US$ 1,000 award.
- Academic Achievement Awards, National Taiwan University, 2014. Jun 2014
  NT$ 2,000 award for GPA in top 5% of the students in a class of 48 students.

PROFESSIONAL ACTIVITIES

- Program Associate Chair.
  - Paper track, ACM CHI 2024 - 2025.
  - Paper track, ACM UIST 2024.
  - Late-Breaking Works, ACM CHI 2021 - 2024.
  - Work-in-Progress, ACM TEI 2021.
- Organization Chair.
  - Video Preview Chair, ACM CHI 2022 - 2024.
  - Student Volunteer Chair, ACM IUI 2022.
- Paper Session Chair.
  - ACM CHI 2024: Touch, Gesture and Posture.
  - ACM CHI 2023: Theory and Model Development.
  - CHI 2022: Intelligent Interaction Techniques.
  - ACM IUI 2022: Mobiles and Wearables.
  - ACM UIST 2021: Touch and Other Input Methods.
- Paper Reviewing.
  - CHI 2016 - 2024.
  - UIST 2022 - 2024.
  - ACM Transactions on Computer-Human Interaction 2023.
  - IEEE Transactions on Haptics 2019, 2021. IEEE Haptics Symposium 2020.
  - International Journal of Human-Computer Studies 2021.
  - DIS 2020, MobileHCI 2017 - 2020, UbiComp/ISWC 2017, TEI 2017 - 2018, Augmented Human 2017.
- Supervision.
  - Supervising Aida Afshar Mohammadian, Aalto Science Institute (AScI) summer internship 2023.
    Topic: Reward shaping for reinforcement learning and real-time parameter inference.
- Teaching.
  - *Input and Sensing* on Computational User Interface Design Course, 2022.
  - *Bayesian Optimization* on Computational User Interface Design Course, 2021.
  - *Deep Learning* on Computational User Interface Design Course, 2020.
  - *Bayesian Statistics and Probabilistic Programming* on User Research Course, 2020.
  - *Probabilistic Decoding* on Engineering for Humans Course, 2020.
  - *Input Sesning and Data Processing* on Computational User Interface Design Course, 2019.
- Teaching Assistant.
  - Engineering for Humans, 2019.
  - Introduction to Human-Computer Interaction, 2017.
  - Computer Architecture, 2014 - 2016.
- Others
  - Student Volunteer at Siggraph Asia 2016.
  - Software Engineer Internship at Deloitte, Taiwan, 2014 - 2015.

INVITED TALKS

- Meta Reality Labs Research, 2024.
  - Topic: Advancing Optimization via Data.
  - Hosted by Dr. Tanya Jonker.
- University of Luxembourg, 2023.
  - Topic: Breaking the boundaries of human-in-the-loop optimization.
  - Hosted by Prof. Luis Leiva.
- Saarland University, 2023.
  - Topic: Breaking the boundaries of human-in-the-loop optimization.
  - Hosted by Prof. Anna Feit and Prof. Jürgen Steimle.
- Meta Reality Labs Research, 2022.
  - Topic: Rediscovering Affordance.
  - Hosted by Dr. Tanya Jonker.
- Taiwanese Association of Computer Human Interaction, 2021.
  - Topic: Computational workflows for interaction techniques.
  - Hosted by Prof. Liwei Chan.
- National Yang Ming Chiao Tung University, 2020.

- Topic: Button Simulation and Design.
- Hosted by Prof. Liwei Chan.