

# Yi-Chi Liao

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## SUMMARY

Postdoctoral Researcher at *Sensing, Interaction, and Perception Lab* (led by Prof. Christian Holz) at ETH Zürich, fully funded by the ETH Zürich Postdoctoral Fellowship (240k CHF / € 250k). **I develop next-generation Human-in-the-Loop Optimization frameworks to enable adaptive systems and streamlined human-AI co-optimization.** I have been serving as Associate Chairs for ACM CHI and ACM UIST for 2 consecutive years. I was Video Preview Chair for CHI 2022 - 2024, and was Student Volunteer Chair for ACM IUI 2022. Previously, I was a postdoc at Saarland University; I earned my Ph.D. degree at Aalto University, Finland, and was a research intern at Meta Reality Labs Research.

## RESEARCH EXPERIENCES

**ETH Zürich**, Zürich, Switzerland.

- Postdoctoral Researcher. Jun 2024 – Now
  - Host professor: Prof. Christian Holz.
  - Awarded the ETH Zürich Postdoc Fellowship Funding (240k CHF / €260k).

**Saarland University**, Saarbrücken, Germany.

- Postdoctoral Researcher. Nov 2023 – May 2024
  - 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

- [20] 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.)
- [19] 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*.
- [18] 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 FULL PAPERS

- [17] Yi-Chi Liao, Paul Streli, Zhipeng Li, Christopgh Gebhardt, and Christian Holz, “Continual Human-in-the-Loop Optimization,” in *Proceedings of the CHI 2025*, Yokohama, Japan, May 2025. (Acceptance rate = 24.9%)
- [16] Artin Saberpour Abadian, Yi-Chi Liao, Ata Otaran, Rishabh Dabral, Marie Muehlhaus, Christian Theobalt, Martin Schmitz, Jürgen Steimle, “3HANDS Dataset: Learning from Humans for Generating Naturalistic Handovers with Supernumerary Robotic Limbs,” in *Proceedings of the CHI 2025*, Yokohama, Japan, May 2025. (Acceptance rate = 24.9%)

- [15] Yi-Chi Liao, and Christian Holz, “Redefining Affordance via Computational Rationality,” in *Proceedings of the IUI 2025*, Cagliari, Italy Mar 2025.
- [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, Hawaii, 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, Hawaii, May 2024. (Acceptance rate = 26.3%). **Honorable Mention Award (top 5% of submissions).**
- [12] 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%)
- [11] 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 (top 5% of submissions).**
- [10] 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%)
- [9] 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%)
- [8] 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%)
- [7] 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%)

#### CONFERENCE EXTENDED ABSTRACTS

- [6] 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.
- [5] Yi-Chi Liao, “Computational Workflows for Designing Input Devices,” in *Proceedings of the CHI 2021 Adjunct*, Yokohama, Japan, May 2021. (Acceptance rate = 21.7%)
- [4] 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.
- [3] 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.
- [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 Technology*, 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 (240k CHF / £215k), awarded through a review process.
- Paper Award. May 2024
  - Honorable Mention Award at ACM CHI 2024 (publication [13]).
  - Honorable Mention Award at ACM CHI 2022 (publication [11]).
- 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.**
  - 1 x recognitions for IUI 2025 Papers.
  - 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.

## TEACHING

- **Lecturer for Adaptive User Interfaces via Machine Learning (ETH Zürich)** Feb 2025– May 2026
  - I am the main organizer and lecturer of the course.
  - Undergraduate-level seminar; guide students in reading and presenting papers and creating research ideas.
- **Lecturer for Reinforcement Learning for Modeling Humans (ETH Zürich)** Feb 2025– May 2026
  - I am the main organizer and lecturer of the course.
  - Graduate-level seminar; guide students in reading and presenting papers and creating research ideas.
- **Lecturer for Introduction to Human-Computer Interaction (ETH Zürich)** Sep 2024– Dec 2024
  - Led by Prof. Christian Holz and Prof. April Wang.
  - My lectures: *Experiment Design, Optimization and Adaptive Interfaces, Computational Rationality.*
- **Lecturer for Computational User Interface Design (Aalto University)** Sep 2019– Dec 2022
  - Led by Prof. Antti Oulasvirta.
  - My lectures: *Input and Sensing, Bayesian optimization, Deep Learning for HCI, Probabilistic Decoding and Inference.*
- **Lecturer for User Research (Aalto University)** Sep 2020– Dec 2020
  - Led by Dr. Aurélien Nioche.
  - My lecture: *Bayesian Statistics and Probabilistic Programming.*
- **Teaching Assistant for various courses**
  - **Introduction to Human-Computer Interaction** by Prof. Christian Holz and Prof. April Wang, ETH Zürich, 2024.
  - **Engineering for Humans** by Prof. Antti Oulasvirta, Aalto University, 2019.
  - **Introduction to Human-Computer Interaction** by Prof. Bing-Yu Chen, National Taiwan University, 2017.
  - **Computer Architecture** by Prof. Bing-Yu Chen, National Taiwan University, 2014 - 2016.

## ADVISING / MENTORING

- **Jingjing Qiu, Master's student at ETH Zürich** Mar 2025
  - Human-centered optimization framework to guide generative AI for creating optimal webpages and images.
- **Zhipeng Li, 1st-year Ph.D. student at ETH Zürich** Feb 2025
  - Leveraging large language models for human-in-the-loop AR/VR interface adaptation, aimed for UIST 2025.
  - Efficient human-in-the-loop preference optimization for visual design, aimed for UIST 2025.
- **Yao Song, Master's student at University of Zürich** Nov 2024
  - Integrating user preferences into multi-objective UI optimization for AR/VR interaction, aimed for UIST 2025.
- **Ying Xue, 1st-year Ph.D. student at ETH Zürich** Nov 2024
  - Optimizing multi-person pose estimation with sparse wearable devices, submitted to ICCV 2025.
- **Artin Saberpour, Ph.D. student at Saarland University** May 2024
  - Motion generation for wearable robotic limbs using generative models, accepted to CHI 2025 (publication [16]).
- **Aida Afshar, Bachelor's student, Aalto Science Institute (ASCI) summer internship** Aug 2023
  - Reward shaping for biomechanical motion simulations using reinforcement learning.

## ACADEMIC ACTIVITIES

- **Program Associate Chair.**
  - Paper track, ACM CHI 2024 - 2025.
  - Paper track, ACM UIST 2024 - 2025.
  - Late-Breaking Works, ACM CHI 2021 - 2024.
  - Work-in-Progress, ACM TEI 2021.
- **Organization and Volunteering.**
  - Video Preview Chair, ACM CHI 2022 - 2024.
  - Student Volunteer Chair, ACM IUI 2022.
  - Student Volunteer, Siggraph Asia 2016.
- **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.
  - ACM CHI 2016 - 2025.
  - ACM UIST 2022 - 2025.
  - ACM IUI 2024 - 2025.
  - International Journal of Human-Computer Studies 2024.
  - ACM Transactions on Computer-Human Interaction 2023.
  - IEEE Transactions on Haptics 2019, 2021.
  - International Journal of Human-Computer Studies 2021.
  - IEEE Haptics Symposium 2020.
  - DIS 2020; MobileHCI 2017 - 2020; UbiComp/ISWC 2017; TEI 2017 - 2018; Augmented Human 2017.

## INVITED TALKS

- University of Cambridge, 2024.
  - Topic: Computational Search and Optimization for Adaptive Interfaces.
  - Hosted by Prof. Per Ola Kristensson.
- 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.