Yi-Chi Liao

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SUMMARY

Postdoctoral Fellow 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 / $ 300K USD). **I advance human-in-the-loop optimization methods to enable adaptive interfaces and streamlined human-AI collaboration.** I have been serving as Associate Chair for both ACM CHI and ACM UIST since 2024 until now. 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 Fellow. Jun 2024 – Now
  - Host professor: Prof. Christian Holz.
  - Awarded the ETH Zürich Postdoc Fellowship Funding (240k CHF / €250k).

Saarland University, Saarbrücken, Germany.

- Postdoctoral Fellow. 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
  - Topic: Rapid Online Parametric Optimization for Wrist-based Interactions (see publication [14]).
  - 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

[26] 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.)

[25] 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*.

[24] 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

[23] Yi-Chi Liao, João Belo, Hee-Seung Moon, Jürgen Steimle, Anna Feit, "Efficient Human-in-the-Loop Optimization via Priors Learned from User Models," in *Proceedings of CHI 2026*, Barcelona, Spain, May 2025 (Accepted, acceptance rate = 25.3%).

[22] Zhipeng Li, Yi-Chi Liao, Christian Holz, " Preference-Guided Prompt Optimization for Image Generation," in *Proceedings of CHI 2026*, Barcelona, Spain, May 2025 (Accepted, acceptance rate = 25.3%).

[21] Zhipeng Li, Christoph Gebhardt, Yi-Chi Liao, Christian Holz, "Automating UI Optimization through Multi-Agentic Reasoning," in *Proceedings of CHI 2026*, Barcelona, Spain, May 2025. (Accepted, acceptance rate = 25.3%).

[20] Yao Song, Christoph Gebhardt, Yi-Chi Liao, and Christian Holz, "Preference-Guided Multi-Objective UI Adaptation," in *Proceedings of UIST 2025*, Busan, Korea, Oct 2025. (Acceptance rate = 22%).

[19] Zhipeng Li, Yi-Chi Liao, and Christian Holz, "Efficient Visual Appearance Optimization by Learning from Prior Preferences," in *Proceedings of UIST 2025*, Busan, Korea, Oct 2025. (Acceptance rate = 22%).

[18] Ying Xue, Jiaxi Jiang, Rayan Armani, Dominik Hollidt, Yi-Chi Liao, and Christian Holz, "Group Inertial Poser: Multi-Person Pose and Global Translation from Sparse Inertial Sensors and Ultra-Wideband Ranging," in *Proceedings of IEEE International Conference on Computer Vision (ICCV)*, Honolulu, Hawaii, Oct 2025. (Acceptance rate = 24.0%).

[17] Yi-Chi Liao, Paul Streli, Zhipeng Li, Christoph Gebhardt, and Christian Holz, "Continual Human-in-the-Loop Optimization," in *Proceedings of CHI 2025*, Yokohama, Japan, May 2025. (Acceptance rate = 24.9%). **Honorable Mention Award (top 5% of submissions)**.

[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 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 IUI 2025*, Cagliari, Italy Mar 2025. (Acceptance rate = 25%)

[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 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 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 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 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 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 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 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 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 CHI 2023 Adjunct*, Hamburg, Germany, May 2023.

[5] Yi-Chi Liao, "Computational Workflows for Designing Input Devices," in *Proceedings of 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 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 2018 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 2015 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 2015 Adjunct*, Osaka, Japan, Sep 2015.

AWARDS & FUNDING

- ETH Zürich Postdoctoral Fellowship. Jan 2024
  - Postdoctoral research funding (240K CHF / €250K Euro / $300K USD), awarded through a review process.
- Paper Award. May 2024
  - Honorable Mention Award at ACM CHI 2025 (publication [17]).
  - Honorable Mention Award at ACM CHI 2024 (publication [13]).
  - Honorable Mention Award at ACM CHI 2022 (publication [11]).
- Co-PI on a Swiss National Science Foundation Project (PI: Prof. Christian Holz). Apr 2025
  - Topic: Personalized Optimization-based User Interface Adaptation in Mixed Reality Input Devices
  - My contribution: Co-writing the research proposal, actively working on the papers supported by this grant.
  - Funding of 600K CHF / €645K Euro / $745K USD.
- ACM CHI '21 Doctoral Consortium. May 2021
  - Topic: Computational Workflows for Designing Input Devices
  - 10 doctoral candidates were accepted out of 46 submissions.
- Special Recognition for Outstanding Reviews.
  - 1 x recognition for CHI 2026 Paper.
  - 1 x recognition for IUI 2025 Paper.
  - 2 x recognitions for CHI 2024 LBWs.
  - 1 x recognition for UIST 2022 Paper.
  - 3 x recognitions for CHI 2021 Papers.
  - 1 x recognition for CHI 2020 Paper.
- Best Implementation Award, Student Innovation Competition, UIST'16. Oct 2016
  EMS Air Guitar, awarded with $1,000 USD.

TEACHING

- Lecturer for the *Computational Interaction* module in **Human-Computer Interaction** (ETH Zürich) Sep 2025– Dec 2025
  - A Bachelor's level course led by Prof. Christian Holz and Prof. April Wang.
  - My lectures: *Multiple topics for Computational Interaction*, such as visual search and visual design, input devices, computational rationality, etc.
- Organizer for **Adaptive User Interfaces via Machine Learning** (ETH Zürich) Feb 2025– May 2026
  - I am the main organizer of the seminar.
  - Undergraduate-level seminar; guide students in reading and presenting papers and creating research ideas.
- Organizer for **Reinforcement Learning for Modeling Humans** (ETH Zürich) Feb 2025– May 2026
  - I am the main organizer of the seminar.
  - Graduate-level seminar; guide students in reading and presenting papers and creating research ideas.
- Lecturer for the *Computational Interaction* module in **Human-Computer Interaction** (ETH Zürich) Sep 2024– Dec 2024
  - A Bachelor's level course led by Prof. Christian Holz and Prof. April Wang.
  - My lectures: *Experiment Design, Optimization and Adaptive Interfaces, Computational Rationality*.
- Lecturer in **Computational Interface Design** (Aalto University) Sep 2019– Dec 2022
  - A Master's level course led by Prof. Antti Oulasvirta.
  - My lectures: *Input and Sensing, Bayesian optimization, Deep Learning for HCI, Probabilistic Decoding and Inference*.
- Guest Lecturer for **User Research** (Aalto University) Sep 2020– Dec 2020
  - A Master's level course led by Dr. Aurélien Nioche.
  - My lecture: *Bayesian Statistics and Probabilistic Programming*.
- Teaching Assistant for various courses
  - **Introduction to Human-Computer Interaction** (Bachelor's level) by Prof. Christian Holz and Prof. April Wang, ETH Zürich, 2024 - 2025.

- **Engineering for Humans** (Bachelor's level) by Prof. Antti Oulasvirta, Aalto University, 2019.
- **Introduction to Human-Computer Interaction** (Bachelor's level) by Prof. Bing-Yu Chen, National Taiwan University, 2017.
- **Computer Architecture** (Bachelor's level) by Prof. Bing-Yu Chen, National Taiwan University, 2014 - 2016.

ADVISING

- Tim Goppelsroeder, Master's student at the Department of Computer Science, ETH Zürich Oct 2025
  - I am the supervisor of this project.
  - Automatically discovering the reward function for acquiring realistic humanoid movements via reinforcement learning (ongoing project).
- Steven Sarbaro, Master's student at the Department of Computer Science, ETH Zürich Jun 2025
  - I am the supervisor of this project.
  - An interactive tool for automatically generating curriculums for training biomechanical models.
- Eliot Ullmo, Master's student at the Department of Computer Science, ETH Zürich Jun 2025
  - I am the supervisor of this project.
  - A novel computational workflow for agent-in-the-loop webpage design.
- Jingjing Qiu, Master's student at the Department of Electrical Engineering, ETH Zürich Mar 2025
  - I am the supervisor of this project.
  - Human-centered optimization framework to guide generative AI for creating optimal webpages and images (aims for UIST 2026).
- Yao Song, Master's student at the Department of Computer Science, University of Zürich Nov 2024
  - I co-supervised Yao with Prof. Christoph Gebhardt.
  - Integrating user preferences into multi-objective UI optimization for AR/VR interaction (accepted to UIST 2025, publication [20]).
- Aida Afshar, Bachelor's student, Aalto Science Institute (AScI) summer internship. Aug 2023
  - I am the supervisor of this 2-month summer internship project.
  - Reward shaping for biomechanical motion simulations using reinforcement learning.

ACADEMIC ACTIVITIES

- Program Associate Chair.
  - Paper track in Computational Interaction Subcommittee, ACM CHI 2024 - 2026.
  - Paper track, ACM UIST 2024 - 2026.
  - 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 UIST 2025: Sense Making.
  - ACM CHI 2025: Text Entry.
  - ACM CHI 2024: Touch, Gesture and Posture.
  - ACM CHI 2023: Theory and Model Development.
  - ACM 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 2021, 2024.
  - ACM Transactions on Computer-Human Interaction 2023.
  - IEEE Transactions on Haptics 2019, 2021; IEEE Haptics Symposium 2020.
  - DIS 2020; MobileHCI 2017 - 2020; UbiComp/ISWC 2017; TEI 2017 - 2018; Augmented Human 2017.

INVITED TALKS

- National Taiwan University, 2025.
  - Semester seminar for graduate students in the Department of Computer Science and Information Engineering.
  - Topic: Interaction as Optimization: Human-in-the-Loop Systems for Evolving Interfaces.
  - Hosted by Prof. Lung-Pan Cheng.
- Daegu Gyeongbuk Institute of Science and Technology (DGIST), 2025.
  - Topic: Human-in-the-Loop Intelligent Interactions for Human-AI Collaboration.
  - Hosted by Prof. Sunjun Kim.
- Chung-Ang University, 2025.

- HCI seminar in the Department of Computer Science and Engineering.
- Topic: Human-in-the-Loop Intelligent Interactions for Human-AI Collaboration.
- Hosted by Prof. Hee-Seung Moon and Prof. Eunji Park.

- University of Copenhagen, 2025.
  - HCI seminar in the Human-Centred Computing Section.
  - Topic: Human-in-the-Loop Intelligent Interactions.
  - Hosted by Prof. Kasper Hornbæk.
- 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.