Chien-Ju Ho

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Contact Information

Dept. of Computer Science & Engineering
Washington University in St. Louis
Campus Box 1045, McKelvey Hall 2010A
One Brookings Drive
St. Louis, MO 63130

Phone: (314) 935-8073
E-mail: chienju.ho@wustl.edu
http://chienjuho.com

Research Interests

Machine learning, algorithmic economics, optimization, online social behavioral science, online algorithm, crowdsourcing, social computing, and artificial intelligence

I am interested in investigating the interactions between humans and AI, including developing AI algorithms to learn from humans (e.g., in the context of crowdsourcing) and designing AI algorithms to assist human decision-making (e.g., through updating decision-making environments or designing assistive information).

Employment

Washington University in St. Louis, St. Louis, MO
Assistant Professor, Computer Science & Engineering, August 2017 to Present

Cornell University, Ithaca, NY
Postdoctoral Associate, October 2015 to July 2017
- Host: Arpita Ghosh

Education

University of California, Los Angeles, Los Angeles, CA
Ph.D., Computer Science, September 2010 to October 2015
- Dissertation: Design and Analysis of Crowdsourcing Mechanisms
- Advisor: Jennifer Wortman Vaughan

Harvard University, Cambridge, MA
Visiting Ph.D. Student, Computer Science, October 2012 to September 2015
- Mentor: Yiling Chen

National Taiwan University, Taipei, Taiwan
M.S., Computer Science and Information Engineering, June 2007
B.S., Computer Science and Information Engineering, June 2005
B.S., Physics, June 2005

Awards

Best Paper Honorable Mention, AAAI Conference on Human Computation and Crowdsourcing (HCOMP), 2021

Best Paper Award Nominee, International World Wide Web Conference (WWW), 2015

Google Outstanding Graduate Research Award, Computer Science, UCLA, 2015

Dissertation Year Fellowship, UCLA, 2014-2015

Ph.D. Students

Wei Tang, Computer Science and Engineering 01/2018 to 08/2022
- Thesis: Human-Centered Machine Learning: Algorithm Design and Human Behavior
- Next Position: Postdoctoral associate at Columbia University

Guanghui Yu, Computer Science and Engineering 01/2020 to present

Saumik Narayanan, Computer Science and Engineering 01/2021 to present

Lauren Treiman, Division of Computational and Data Sciences 09/2022 to present
- Co-advised with Wouter Kool

Alex DiChristofano, Division of Computational and Data Sciences 01/2023 to present

- Co-advised with Patrick Fowler

Robert Kasumba, Division of Computational and Data Sciences 01/2023 to present
- Co-advised with Dennis Barbour

Tory Farmer, Computer Science and Engineering 01/2024 to present

Publications

In most cases, my collaborators and I choose to have students as first authors and then determine the authorship of non-student authors alphabetically.

Students that I advise are marked with $*$.

Rationality-Robust Information Design: Bayesian Persuasion under Quantal Response.
($\alpha - \beta$) Yiding Feng, Chien-Ju Ho, and *Wei Tang.
In the ACM-SIAM Symposium on Discrete Algorithms (SODA), 2024

Encoding Human Behavior in Information Design through Deep Learning.
*Guanghui Yu, *Wei Tang, *Saumik Narayanan, and Chien-Ju Ho.
In the Annual Conference on Neural Information Processing Systems (NeurIPS), 2023.

Humans Forgo Reward to Instill Fairness into AI.
*Lauren Treiman, Chien-Ju Ho, and Wouter Kool.
In the AAAI Conference on Human Computation and Crowdsourcing (HCOMP), 2023.

How Does Value Similarity Affect Human Reliance in AI-Assisted Ethical Decision Making?
*Saumik Narayanan, *Guanghui Yu, Chien-Ju Ho, and Ming Yin.
In the AAAI/ACM Conference on AI, Ethics, and Society (AIES), 2023.

Competitive Information Design for Pandora's Box.
($\alpha - \beta$) Bolin Ding, Yiding Feng, Chien-Ju Ho, *Wei Tang, and Haifeng Xu.
In the ACM-SIAM Symposium on Discrete Algorithms (SODA), 2023.

Environment Design for Biased Decision Makers.
*Guanghui Yu and Chien-Ju Ho.
In the International Joint Conference on Artificial Intelligence (IJCAI), 2022.

How Does Predictive Information Affect Human Ethical Preferences?
*Saumik Narayanan, *Guanghui Yu, *Wei Tang, Chien-Ju Ho, and Ming Yin.
In the AAAI/ACM Conference on AI, Ethics, and Society (AIES), 2022.

The Influences of Task Design on Crowdsourced Judgement: A Case Study of Recidivism Risk Evaluation.
Xiaoni Duan, Chien-Ju Ho, and Ming Yin.
In the Web Conference (WWW), 2022.

Bandit Learning with Delayed Impact of Actions.
*Wei Tang, Chien-Ju Ho, and Yang Liu.
In the Annual Conference on Neural Information Processing Systems (NeurIPS), 2021.

On the Bayesian Rational Assumption in Information Design.
*Wei Tang and Chien-Ju Ho.
In the AAAI Conference on Human Computation and Crowdsourcing (HCOMP), 2021.
Best Paper Honorable Mention.

Linear Models are Robust Optimal Under Strategic Behavior.
*Wei Tang, Chien-Ju Ho, and Yang Liu.
In the International Conference on Artificial Intelligence and Statistics (AISTATS), 2021.

Efficient Nonmyopic Online Allocation of Scarce Reusable Resource.
*Zehao Dong, Sanmay Das, Patrick Fowler, and Chien-Ju Ho.
In the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2021.

Optimal Query Complexity of Secure Stochastic Convex Optimization.
*Wei Tang, Chien-Ju Ho, and Yang Liu.
In the Annual Conference on Neural Information Processing Systems (NeurIPS), 2020.

Does Exposure to Diverse Perspectives Mitigate Biases in Crowdwork? An Explorative Study.
Xiaoni Duan, Chien-Ju Ho, and Ming Yin.
In the AAAI Conference on Human Computation and Crowdsourcing (HCOMP), 2020.

Differentially Private Contextual Dynamic Pricing.
*Wei Tang, Chien-Ju Ho, and Yang Liu.
In the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2020.

Incorporating Compatible Pairs in Kidney Exchange: A Dynamic Weighted Matching Model.
Zhuoshu Li, *Kelsey Lieberman, *William Macke, Sofia Carrillo, Chien-Ju Ho, Jason Wellen, and Sanmay Das.
In the ACM conference on Economics and Computation (EC), 2019.

Leveraging Peer Communication to Enhance Crowdsourcing.
*Wei Tang, Chien-Ju Ho, and Ming Yin.
In The Web Conference 2019 (WWW), 2019.

Bandit Learning with Biased Human Feedback.
*Wei Tang and Chien-Ju Ho.
In the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2019.

Incentivizing High Quality User Contributions: New Arm Generation in Bandit Learning.
Yang Liu and Chien-Ju Ho.
In the AAAI Conference on Artificial Intelligence (AAAI), 2018.

Eliciting Categorical Data for Optimal Aggregation.
Chien-Ju Ho, Rafael Frongillo, and Yiling Chen.
In the Annual Conference on Neural Information Processing Systems (NIPS), 2016.

Adaptive Contract Design for Crowdsourcing Markets: Bandit Algorithms for Repeated Principal-Agent Problems.
Chien-Ju Ho, Aleksandrs Slivkins, and Jennifer Wortman Vaughan.
Journal of Artificial Intelligence Research, Volume 55, pages 317-359, 2016. (Supersedes the EC'14 paper)

Low-Cost Learning via Active Data Procurement.
Jacob Abernethy, Yiling Chen, Chien-Ju Ho, and Bo Waggoner.
In the ACM Conference on Economics and Computation (EC), 2015.

Incentivizing High Quality Crowdwork.
Chien-Ju Ho, Aleksandrs Slivkins, Siddharth Suri, and Jennifer Wortman Vaughan.
In the International World Wide Web Conference (WWW), 2015.
Nominee for Best Paper Award.

Adaptive Contract Design for Crowdsourcing Markets: Bandit Algorithms for Repeated Principal-Agent Problems.
Chien-Ju Ho, Aleksandrs Slivkins, and Jennifer Wortman Vaughan.
In the ACM Conference on Economics and Computation (EC), 2014.

Adaptive Task Assignment for Crowdsourced Classification.
Chien-Ju Ho, Shahin Jabbari, and Jennifer Wortman Vaughan.
In the International Conference on Machine Learning (ICML), 2013.

Online Task Assignment in Crowdsourcing Markets.
Chien-Ju Ho and Jennifer Wortman Vaughan.
In the AAAI Conference on Artificial Intelligence (AAAI), 2012.

Towards Social Norm Design for Crowdsourcing Markets.
Chien-Ju Ho, Yu Zhang, Jennifer Wortman Vaughan, and Mihaela van der Schaar.
In the Human Computation Workshop (HCOMP), 2012.

DevilTyper: A Game for CAPTCHA Usability Evaluation.
Chien-Ju Ho, Chen-Chi Wu, Kuan-Ta Chen, and Chin-Laung Lei.
In ACM Computers in Entertainment, 2011.

On Formal Models for Social Verification.
Chien-Ju Ho and Kuan-Ta Chen.
In the Human Computation Workshop (HCOMP), 2009.

KissKissBan: A Competitive Human Computation Game for Image Annotation (Short Paper).
Chien-Ju Ho, Tao-Hsuan Chang, Jong-Chuan Lee, Jane Yung-jen Hsu, and Kuan-Ta Chen.
In the Human Computation Workshop (HCOMP), 2009.

Designing Human-Computer Multi-agent Collaboration in Productive Multi-player Games (Short Paper).
Wenn-Chieh Tsai, Yuan-Hsiang Lee, Tsung-Hsiang Chang, Chien-Ju Ho, and Jane Yung-jen Hsu.
In the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2008.

PhotoSlap: A Multi-player Online Game for Semantic Annotation.
Chien-Ju Ho, Tsung-Hsiang Chang, and Jane Yung-jen Hsu.
In the AAAI Conference on Artificial Intelligence (AAAI), 2007.

The PhotoSlap Game: Play to Annotate (Intelligent System Demo).
Tsung-Hsiang Chang, Chien-Ju Ho, and Jane Yung-jen Hsu.
In the AAAI Conference on Artificial Intelligence (AAAI), 2007.

Funding

Leveraging Machine Learning to Model Human Behavior and Improve Decision Making
- Funding agency: J.P. Morgan Faculty Research Award
- Role: PI
- Award amount: $70,000
- Duration: 09/2023-09/2024

Accounting for Human Biases to Improve AI-Assisted Decision Making
- Funding agency: WashU TRIADS Seed Grant
- Role: Co-PI (PI: Wouter Kool)
- Award amount: $39,906
- Duration: 04/2023-03/2024

Understanding and Accounting for Human Behavior and Beliefs in Human-AI Collaboration
- Funding agency: McDonnell International Scholars Academy: Global Incubator Seed Grant

- Role: Co-PI (PI: William Yeoh)
- Award amount: $25,000
- Duration: 12/2022-12/2023

Forming Representative Cohorts: Sequential Recruitment under Uncertainty
- Funding agency: J.P. Morgan Faculty Research Award
- Role: PI (Co-PI: Yevgeniy Vorobeychik)
- Award amount: $95,000
- Duration: 09/2022-04/2024

Promoting AI Research: HCOMP 2022 Doctoral Consortium
- Funding agency: Artificial Intelligence Journal (AIJ)
- Role: PI (with Alex Williams, Amazon)
- Award amount: Euro 3,000

Sequential Decision Making with Human Biases
- Funding agency: Office of Naval Research (ONR)
- Role: PI
- Award amount: $453,151
- Duration: 4/2020-6/2023

AI: FairGame: An Audit-Driven Game Theoretic Framework for Development and Certification of Fair AI
- Funding agency: National Science Foundation (NSF) / Amazon
- Role: Co-PI (PI: Yevgeniy Vorobeychik)
- Award amount: $785,000
- Duration: 1/2020-12/2022

Solving Homelessness Using Data-Driven Feedback Systems
- Funding agency: Washington University OVCR
- Role: Co-PI (PI: Patrick Fowler)
- Award amount: $50,000
- Duration: 6/2019-6/2020

Teaching Experience

Instructor, Washington University in St. Louis 2017 to Present

CSE 417T: Introduction to Machine Learning
- Fall 2017, Fall 2018, Spring 2020, Spring 2021, Spring 2022, Fall 2022

CSE 518A: Human-in-the-Loop Computation / Crowdsourcing and Human Computation
- Spring 2019, Fall 2019, Fall 2020, Fall 2021, Fall 2022, Spring 2024

Full-time Teaching Assistant, National Taiwan University 2009 to 2010
- Administrator of the Logic Laboratory.
- Instructor of the course "Digital Circuit Laboratory".
- Instructor of the course "Digital System Laboratory".
- Teaching assistant of "Artificial Intelligence" and "Digital System Design".

Service

Conference Services:
Doctoral Consortium Co-Chair: HCOMP 2022
Works-in-Progress and Demonstration Co-Chair: HCOMP 2019

Area Chair or Senior Program Committee:
AAAI Conference on Artificial Intelligence (AAAI): 2020, 2021, 2022, 2023,2024
Conference on Neural Information Processing Systems (NeurIPS): 2021, 2022, 2023
International Conference on Learning Representations (ICLR): 2024
International Conference on Machine Learning (ICML): 2023, 2024
International Joint Conference on Artificial Intelligence (IJCAI): 2021

Program Committee or Formal Reviewer:
AAAI/ACM Conference on AI, Ethics, and Society (AIES): 2023
AAAI Conference on Artificial Intelligence (AAAI): 2013, 2018, 2019
AAAI Conference on Human Computation and Crowdsourcing (HCOMP): 2016, 2018
ACM Conference on Economics and Computation (EC): 2015, 2016, 2017, 2018
ACM Conference on Fairness, Accountability, and Transparency (FAccT): 2023
ACM International Conference on Web Search and Data Mining (WSDM): 2021
Conference on Neural Information Processing Systems (NIPS, NeurIPS): 2013-2020
International Conference on Machine Learning (ICML): 2021, 2022
International Joint Conference on Artificial Intelligence (IJCAI): 2015, 2016, 2018, 2020, 2022
International World Wide Web Conference (WWW): 2017, 2018, 2019, 2021, 2022

Auxiliary Reviewer:
HCOMP 2012, HCOMP 2013 WiP, WINE 2013, AAAI 2014, WINE 2016, FAMAS 2019

Workshop Organizer:
HCOMP Workshop on Mathematical Foundations of Human Computation, 2016
NIPS Workshop on Crowdsourcing and Machine Learning, 2014

Journal Referee:
ACM Transactions on Intelligent Systems and Technology
ACM Transactions on Economics and Computation
Artificial Intelligence Journal
Annals of Mathematics and Artificial Intelligence
Autonomous Agents and Multi-Agent Systems
IEEE Transactions on Computational Intelligence and AI in Games
IEEE Transactions on Computational Social Systems
IEEE Transactions on Knowledge and Data Engineering
IEEE Transactions on Parallel and Distributed Systems
Journal of Artificial Intelligence Research
Journal of Machine Learning Research
Journal of the Association for Information Science and Technology
World Wide Web Journal

Organizer of UCLA Social Computing Reading Group, Sep. 2011 to Mar. 2012