

# Chao Huang

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## WORKING EXPERIENCE

- **Montclair State University** New Jersey, U.S.  
*Assistant professor, Computer Science* *Sep. 2024 - now*
- **University of California, Davis** California, U.S.  
*Postdoctoral Researcher, Computer Science* *Dec. 2021 - Jun. 2024*  
*Advisor: Xin Liu (FIEEE)*
- **City University of Hong Kong** Hong Kong  
*Postdoctoral Fellow, Management Science* *July 2021 - Nov. 2021*  
*Advisor: Biying Shou (Associate Department Head)*

## EDUCATION

- **The Chinese University of Hong Kong** Hong Kong  
*Ph.D., Information Engineering* *Aug. 2017 - June 2021*  
*Advisor: Jianwei Huang (Associate Vice President, CUHKSZ, FIEEE)*  
*Co-advisor: Randall Berry (Department Chair at ECE, Northwestern, FIEEE)*
- **Sichuan University** Sichuan, China  
*B.E., Electronics and Information Engineering* *Sept. 2013 - June 2017*  
*Grade ranking: 1/123*

## RESEARCH INTERESTS

I am interested in interdisciplinary research that spans both artificial intelligence and economics:

- AI/ML Algorithms and Applications, Data Science
  - Federated learning, split learning, online learning
  - Online data acquisition, information elicitation without verification
  - Applied machine learning (in medical and agricultural domains)
- Network Science and Economics
  - Crowdsourcing, mobile crowdsensing
  - Electric vehicle charging, vehicle-to-grid
  - Mechanism design, game theory

## PUBLICATIONS

\* denotes equal contribution

- **Journal Papers**

- [J1] Y. Yan, X. Tang, **C. Huang**, M. Tang, “Incentivizing Efficient Label Denoising in Federated Learning,” *Internet of Things Journal (IoT-J)*, August 2024.
- [J2] **C. Huang**, J. Dacheille, and X. Liu, “When Federated Learning Meets Oligopoly Competition: Stability and Model Differentiation,” Accepted to *IEEE Internet of Things Journal (IoT-J)*.
- [J3] **C. Huang**, M. Tang, Q. Ma, J. Huang, X. Liu, “Promoting Collaborations in Cross-Silo Federated Learning: Challenges and Opportunities,” *IEEE Communications Magazine*, 2023.
- [J4] **C. Huang**, S. Ke, X. Liu, “Duopoly Business Competition in Cross-Silo Federated Learning,” *IEEE Transactions on Network Science and Engineering (TNSE)*, 2023
- [J5] **C. Huang**, H. Yu, J. Huang, and R. Berry, “An Online Inference-Aided Incentive Framework for Information Elicitation Without Verification,” *IEEE Journal on Selected Areas in Communications (JSAC)*, Feb. 2023.
- [J6] **C. Huang**, H. Yu, J. Huang, and R. Berry, “Online Crowd Learning with Strategic Worker Reports,” *IEEE Transactions on Mobile Computing (TMC)*, May 2022.
- [J7] **C. Huang**, H. Yu, J. Huang, and R. Berry, “Strategic Information Revelation Mechanism in Crowdsourcing Applications Without Verification,” *IEEE Transactions on Mobile Computing (TMC)*, Nov. 2021.
- [J8] **C. Huang**, H. Yu, J. Huang, and R. Berry, “Eliciting Information from Heterogeneous Mobile Crowdsourced Workers Without Verification,” *IEEE Transactions on Mobile Computing (TMC)*, Feb. 2021.
- [J9] **C. Huang**, H. Yu, R. Berry, and J. Huang, “Using Truth Detection to Incentivize Workers in Mobile Crowdsourcing,” *IEEE Transactions on Mobile Computing (TMC)*, Oct. 2020.
- [J10] J. Kim, R. Rupasinghe, A. Halev, **C. Huang**, S. Rezaei, M. Clavijo, R. Robbins, B. Lopez, X. Liu, “Predicting Antimicrobial Resistance of Bacterial Pathogens using Time Series Analysis,” *Frontiers in Microbiology, section Antimicrobials, Resistance and Chemotherapy*, Apr. 2023.
- [J11] A. Halev, B. Lopez, M. Clavijo, C. Crespo, J. Kim, **C. Huang**, R. Robbins, and Xin Liu, “Outbreak Prediction in Swine Populations with Machine Learning”, *Scientific Reports*, 2023.

- **Conference Papers**

- [C1] P. Han\*, **C. Huang\***, T. Gen, M. Tang, and X. Liu, “Convergence Analysis of Split Federated Learning on Heterogeneous Data,” *Conference on Neural Information Processing Systems (NeurIPS)*, Vancouver, Canada, December 2024.
- [C2] **C. Huang**, J. Dacheille, and X. Liu, “Coopetition in Heterogeneous Cross-Silo Federated Learning” *European Conference on Artificial Intelligence (ECAI)*, Santiago de Compostela, Spain October, 2024.
- [C3] **C. Huang**, J. Dacheille, and X. Liu, “An Accuracy-Shaping Mechanism for Competitive Split Federated Learning,” *International Conference on Artificial Neural Networks (ICANN)*, Lugano, Switzerland, September, 2024.
- [C4] P. Han\*, **C. Huang\***, X. Shi, J. Huang, X. Liu, “Incentivizing Participation in SplitFed Learning: Convergence Analysis and Model Versioning,” *IEEE International Conference on Distributed Computing Systems (ICDCS)*, Jersey City, USA, July 2024.
- [C5] H. Son, M. Kim, T. Chung, **C. Huang**, X. Liu, “FedUV: Uniformity and Variance for Heterogeneous Federated Learning,” *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Seattle, USA, June 2024.
- [C6] **C. Huang**, P. Han, J. Huang, “Incentive Mechanism Design for Distributed Ensemble Learning,” *IEEE Global Communications Conference (GLOBECOM)*, 2023.
- [C7] C. Sun, **C. Huang**, B. Shou, J. Huang, “Federated Learning in Competitive EV Charging Market,” *IEEE PES ISGT EUROPE 2023*.
- [C8] Y. Yan, X. Tang, **C. Huang**, M. Tang, “Price of Stability in Quality-Aware Federated Learning,” *IEEE Global Communications Conference (GLOBECOM)*, 2023.
- [C9] S. Ke, **C. Huang**, and X. Liu, “On the Impact of Label Noise in Federated Learning,” *International Symposium on Modeling and Optimization in Mobile, Ad hoc, and Wireless Networks (WiOpt)*, 2023.
- [C10] **C. Huang**, H. Yu, J. Huang, and R. Berry, “Strategic Information Revelation in Crowdsourcing Systems Without Verification,” *IEEE International Conference on Computer Communications (INFOCOM)*, May 2021.

- [C11] **C. Huang**, H. Yu, J. Huang, and R. Berry, "Online Crowd Learning with Heterogeneous Workers via Majority Voting," *International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt)*, Volos, Greece, June 2020.
- [C12] **C. Huang**, H. Yu, J. Huang, and R. Berry, "Crowdsourcing with Heterogeneous Workers in Social Networks," *IEEE Global Communications Conference (GLOBECOM)*, Waikoloa, HI, USA, Dec. 2019.
- [C13] **C. Huang**, H. Yu, J. Huang, and R. Berry, "Incentivizing Crowdsourced Workers via Truth Detection," *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Ottawa, Canada, Nov. 2019.

● **Workshop Papers**

- [W1] K. Chen, **C. Huang**, and J. Huang, "Information Elicitation from Decentralized Crowd Without Verification," *WiOpt Workshop on Resource Allocation and Cooperation in Wireless Networks (RAWNET)*, Singapore, Aug. 2023.
- [W2] S. Ke, **C. Huang**, and X. Liu, "Quantifying the Impact of Label Noise on Federated Learning," *AAAI Workshop on Representation Learning for Responsible Human-Centric AI (R2HCAI)*, Washington D.C., USA, Feb. 2023.

● **Book Chapter**

- [B1] **C. Huang**, H. Yu, J. Huang, and R. Berry, "Incentive Mechanism Design for Mobile Crowdsourcing Without Verification," included in "Advances in Mobile Crowdsourcing: From Theory to Practice", Springer, 2023.

**Research Grants**

● **Student Conference/Travel Grant**

- 2021 IEEE INFCOM, 2019 IEEE GLOBECOM, 2019 IEEE GlobalSIP

- **Research Student Grants for Overseas Academic Activities** CUHK 2019, 2020
- **Postgraduate Studentship** CUHK 2017-2021
- **Research Assistant Grants** AIRS 2019

**AWARDS**

- **Best Team Presentation Award (2nd place)** Wageningen University & Tencent, 2021
  - Hackathon of the 3rd international Autonomous Greenhouse Challenge
- **Best Team Player Award** CUHK NCEL, 2020
- **Best Student Presentation Award** CUHK NCEL, 2018, 2020, 2021
- **Outstanding Thesis Award** Sichuan University, 2017
- **Outstanding Graduate** Sichuan University, 2017
- **National Scholarship** (selection ratio 2%) Sichuan University, 2014

**Teaching and Advising Experiences**

- **Lecturer** Dept. of Computer Science, Montclair State University

- CSIT 598: Machine Learning (fall 2024)
- **Guest Lecturer** Dept. of Computer Science, The University of California, Davis
  - ECS 293A: Research in Computer Science (Fall 2022); lecture on academic writing
- **Teaching Assistant** Dept. of Information Engineering, The Chinese University of Hong Kong
  - IERG3320: Social Media and Human Information Interaction (Fall 2020)
  - IERG3820: Communication Lab (Spring 2020)
  - IERG3310: Computer Networks (Fall 2019)
  - IERG3820: Communication Lab (Spring 2019)
  - IERG3820: Communication Lab (Fall 2018)
  - IERG3310: Computer Networks (Spring 2018)
  - IERG3820: Communication Lab (Fall 2017)
- **Research Co-Advisor** Department of Computer Science, University of California, Davis
  - Co-advising PhD student at UC Davis on data quality in GAN Oct. 2022- May 2023
  - Co-advising PhD students at UC Davis on applied machine learning Dec. 2021-May 2022
  - Co-advising master student at UC Davis on federated learning Mar. 2023 - present
  - Co-advising PhD student at CUHKSZ on crowd intelligence July 2021-May 2024
  - Co-advising undergraduate student at UC Berkeley on federated learning June 2022 - May 2023

## Professional Activities

- **Academic Services**
  - Presentation Committee 2023 PRS-UC Davis
  - Technical Program Committee 2025 ICIEI, 2023 IJTCS-FAW
  - Publicity Chair 2022 IEEE SECON - ECOFEC workshop
  - Co-host and Lecturer 2020 CUHKSZ summer workshop
- **Invited Talks**
  - Incentivizing Data Contribution in Cross-Silo Federated Learning Penn State, June 2022
  - Incentive Mechanism Design for Crowdsourcing Systems Without Verification BLCU, Dec. 2021
- **Poster/Demo Presentations**
  - Towards Mitigating Free-Riding Attacks in Federated Learning UC Riverside, Sep. 2022
- **Technical Review**
  - IEEE/ACM Transactions on Networking (ToN)
  - IEEE Transactions on Mobile Computing (TMC)
  - IEEE Transactions on Networking Science and Engineering (TNSE)
  - IEEE Transactions on Parallel and Distributed Systems (TPDS)
  - IEEE Transactions on Dependable and Secure Computing (TDSC)
  - IEEE Transactions on Computational Social Systems (TCSS)
  - IEEE Open Journal of Communications Society (OJCOMS)

- ACM Transactions on Intelligent Systems and Technology (TIST)
- Journal of Data and Information Quality
- IEEE International Conference on Computer Communications (INFOCOM)
- ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)
- International Conference on Machine Learning (ICML)
- Artificial Intelligence and Statistics (AISTATS)
- International Conference on Learning Representations (ICLR)
- Annual Conference on Neural Information Processing Systems (NeurIPS)
- IEEE Global Communications Conference (GLOBECOM)
- Military Communications Conference (MILCOM)
- IEEE International Conference on Sensing, Communication, and Networking- Workshop on the Economics of Fog, Edge and Cloud Computing (SECON-ECOFEC)