

WEI-NING CHEN

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Education

Stanford University <i>PhD in Electrical Engineering</i>	California, US 2019–
National Taiwan University <i>MS in Graduate Institute of Communication Engineering (GICE)</i> <ul style="list-style-type: none">Overall GPA: 4.23/4.3Thesis: Fundamental Limits of Anonymous Statistical Inference: Privacy-Preserving Crowdsourcing	Taipei, Taiwan 2016–2018
National Taiwan University <i>BS in Electric Engineering and Mathematics (double major)</i> <ul style="list-style-type: none">Overall GPA: 3.96/4.3 (EE: 4.05/4.3, Math: 3.96/4.3)	Taipei, Taiwan 2012–2016

Research Interests

I am interested in information-theoretic and algorithmic aspects of data science, and currently focus on the generalization ability of deep neural networks. My research adopts tools mainly from *information theory*, *statistical machine learning* and *theoretical statistics*.

Publications

Journal Article

- [1] [Wei-Ning Chen](#) and I-Hsiang Wang, “Anonymous Heterogeneous Distributed Detection: Optimal Decision Rules, Error Exponents, and the Price of Anonymity”, *IEEE Transaction on Information Theory* (to appear), May 2019

Conference Proceedings

- [1] [Wei-Ning Chen](#) and I-Hsiang Wang, “On the Price of Source Anonymity in Heterogeneous Parametric Point Estimation”, *IEEE International Symposium on Information Theory (ISIT)*, Paris, July 2019
- [2] [Wei-Ning Chen](#), Ho-Chun Chen, and I-Hsiang Wang, “On the Fundamental Limits of Heterogeneous Distributed Detection: Price of Anonymity”, *IEEE International Symposium on Information Theory (ISIT)*, Vail, June 2018
- [3] [Wei-Ning Chen](#) and I-Hsiang Wang, “Partial Data Extraction via Noisy Histogram Queries: Information Theoretic Bounds”, *IEEE International Symposium on Information Theory (ISIT)*, Aachen, June 2017

Honors and Awards

Stanford Graduate Fellowship (2019 – 2022) <i>Stanford University</i>	<i>Feb. 2019</i>
GICE Best Master Thesis Award <i>Graduate Institute of Communication Engineering, National Taiwan University</i>	<i>Jan. 2019</i>
The First Prize of CIEE Best Master Thesis Award <i>Chinese Institute of Electrical Engineering</i>	<i>Oct. 2018</i>
TIEEE Best Master Thesis Award <i>Taiwan Institute of Electrical and Electronic Engineering</i>	<i>Oct. 2018</i>
ISIT Student Travel Grant <i>IEEE Symposium on Information Theory (ISIT)</i>	<i>Jun. 2018</i>

Outstanding Students Conference Travel Grant

Foundation for the Advancement of Outstanding Scholarship

Jun. 2018

Funding for Participation at International Conferences by Domestic Graduate Students

Ministry of Science and Technology (MOST)

Jun. 2017

Silver Medal in Macronix Science Awards (with scholarship about US \$6500)

Macronix Science Foundation

Sep. 2011

Academic Activities

IEEE International Conference on Communications (ICC)

Reviewer

Oct. 2018

IEEE East Asian School of Information Theory and Communication (EASITC)

Student Volunteer

Aug. 2018

2017 Summer School on Information Theory, Communication Theory and Technologies

Attendee

Aug. 2017

IEEE Taiwan/Hong Kong Joint Workshop on Info. Theory and Communications

Attendee

Aug. 2016, Aug. 2017

Selected Research Experiences

Anonymous Parameter Estimation from Heterogeneous Sources

Networked Information and Communication Lab, Advisor: I-Hsiang Wang

Oct. 2018 – Jan. 2019

- Studied parameter estimation problem with an unknown permutation on joint samples
- Characterized the performance decrease, in terms of Fisher information, due to anonymity
- Submitted to ISIT 2019, preprint available upon request

Fundamental Limits of Privacy Preserving Crowdsourcing

Networked Information and Communication Lab, Advisor: I-Hsiang Wang

Feb. 2018 – Jul. 2018

- Proposed optimal label recovery algorithm when crowds' reliabilities are anonymous
- Evaluated asymptotic probability of errors under Neyman-Pearson regime and Chernoff regime
- Master thesis, online version available at https://weiningchen.github.io/paper/thesis_v4.pdf

Anonymous Hypothesis Testing

Networked Information and Communication Lab, Advisor: I-Hsiang Wang

Sep. 2017 – Jul. 2018

- Proved *optimal decision rules* and specified rates of detection errors for anonymous hypothesis testing
- Presented in ISIT 2018, Vail. Full version available at https://weiningchen.github.io/paper/isit18_AHD.pdf
- Submitted to *IEEE Transactions on Information Theory* (under revision), preprint available at arXiv

Data Extraction via Noisy Pooling

Networked Information and Communication Lab, Advisor: I-Hsiang Wang

Sep. 2016 – Jun. 2017

- Characterized phase transitions between data recovery ratio and noise magnitude for the pooled data problem
- Presented at ISIT 2017, Aachen. Full version available at https://weiningchen.github.io/paper/isit17_NHQ.pdf

Direct Anonymous Attestation

Undergraduate Research Project, Advisor: Chen-Mou Cheng

Sep. 2014 – Jun. 2015

- Implemented “Direct Anonymous Attestation” protocol in C++
- Source codes available at <https://github.com/WeiningChen/DAA>

Teaching Experiences

Mathematical Principle of Machine Learning (CommE5051)

Teaching Assistant

GICE, NTU

Spring 2018

- Instructed lecture on concentration inequalities

Information Theory (EE5028)

Teaching Assistant

- Led recitation sessions (in English)

Calculus (MATH1202)

Teaching Assistant

- Led recitation sessions

GICE , NTU

Fall 2016, Fall 2017

EE , NTU

Spring 2016

Related Courses

Analysis	Advanced Calculus (I)(II)/ Linear Algebra (I)(II)/ Complex Analysis/ Partial Differential Equation/ Nonlinear Programing
Probability and Statistics	Probability and Statistics/ Mathematical Principle of Machine Learning/ Statistical Foundation of Data Science/ Stochastic Calculus/ Information Theory
Computer Science	Discrete Mathematics/ Operating System/ Cryptography/ Artificial Intelligence/ Advanced Algorithms/ Computation Theory

Reading Group: (Organized by Prof. I-Hsiang Wang)

- Studied “Prediction, Learning, and Games” by N. Cesa-Bianchi and G. Lugosi
- Studied “High-Dimensional Probability” by R. Vershynin

Fall 2017

Spring 2017

Technical Strengths

Programming Skills	C/C++, Python, Javascript, Matlab, L ^A T _E X
GRE Subject Math	910 (97%)
GRE General	334/340 (V164, Q170, AW 3.5)
TOEFL iBT	106/120 (R29, L30, S21, W26)

References

I-Hsiang Wang (Master Advisor)

🌐 website · ✉ available upon request

Associate Professor

Department of Electrical Engineering
National Taiwan University

Shih-Chun Lin

🌐 website · ✉ available upon request

Associate Professor

Department of Electronic and Computer Engineering,
National Taiwan University of Science and Technology