Wei-Ning Chen

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Education

National Taiwan University **Taipei, Taiwan**
Master of Science in Graduate Institute of Communication Engineering (GICE) *2016–present*

- Overall GPA: 4.23/4.3
- Master Thesis: Fundamental Limits of Anonymous Statistical Inference: Privacy-Preserving Crowdsourcing

National Taiwan University **Taipei, Taiwan**
Bachelor of Science in Electric Engineering and Mathematics (dual degree) *2012–2016*

- Overall GPA: 3.96/4.3 (EE: 4.05/4.3, Math: 3.96/4.3)
- Macronix Science Awards Scholarship $200,000 (about US $6500)

Research Interests

I am interested in information-theoretic and algorithmic aspects of data science, and currently focus on studying the impact of privacy and anonymity on information retrieval problem. My research adopts tools mainly from *information theory*, *machine learning* and *statistical inference*.

Publications

[1] Wei-Ning Chen and I-Hsiang Wang, "Anonymous Heterogeneous Distributed Detection: Optimal Decision Rules, Error Exponents, and the Price of Anonymity", *arXiv:1805.03554* (submitted to *IEEE Transaction on Information Theory*), Feb 2018

[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

Research Experience

Fundamental Limits of Privacy Preserving Crowdsourcing
Networked Information and Communication Lab, Advisor: I-Hsiang Wang *Feb. 2018 – Present*

- Proposed optimal label recovery algorithm when crowds' relaibilities 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*

- Developed optimal decision rules and specified rates of detection errors for anonymous composite hypothesis testing
- Presented in ISIT 2018, Vail, with ISIT student travel grant
- 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 in ISIT 2017, Aachen, with ministry of science and technology (MOST) travel support
- Online version available at `https://weiningchen.github.io/paper/isit17_NHQ.pdf`

Differential Private Distributed Estimation
Undergraduate Research Project, Advisor: I-Hsiang Wang *Sep. 2015 – Jun. 2016*

- Proposed an statistical-efficient differential private point estimator for distributed system
- Technical report available at `https://weiningchen.github.io/paper/project_DPE.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`

Optimal Grid Partition via Buffon's Needle
High School Research Project, Advisor: Lee-Fu Mou *Sep. 2010 – Feb. 2012*

- Extended Buffon's approach to determine optimal geological grid partition which maximizes spatial resolving power
- Won silver medal in *Macronix Science Awards* with scholarship $200,000 (about US $6500) and excellent work award in *International Science Exhibition*

Teaching Experience

Mathematical Principle of Machine Learning (CommE5051) **GICE , NTU**
Teaching Assistant *Spring 2018*

- Instructed lecture on concentration inequalities

Information Theory (EE5028) **GICE , NTU**
Teaching Assistant *Fall 2016, Fall 2017*

- Led recitation sessions (in English)

Calculus (MATH1202) **EE , NTU**
Teaching Assistant *Spring 2016*

- Graded homeworks and quizzes

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 *Fall 2017*
- Studied "High-Dimensional Probability" by R. Vershynin *Spring 2017*
- Studied "Understanding Machine Learning" by S. Shalev-Shwartz and S. Ben-David *Fall 2016*

Technical Strengths

Programming Skills	C/C++, Python, Javascript, Matlab, LaTeX
GRE	334/340 (Verbal: 164 (94%), Quantitative: 170 (96%), AW 3.5)
TOEFL iBT	106/120 (R29, L30, S21, W26)