

Ya-Chi Chu

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EDUCATION

Stanford University

Stanford, United States

Ph.D. in Mathematics, GPA: 4.025/4.00

Sep. 2021 – present

- *Supervisor*: Prof. Madeleine Udell and Prof. Lexing Ying
- *Research Fields*: Optimization Algorithms, Randomized Numerical Linear Algebra, Online Learning
- *Research directions*: Scalable Interior-Point Methods, Online Preconditioning, Hypergradient Adaptive Stepsize, Differentiable Projection, Randomized Trace Estimator

National Cheng Kung University (NCKU)

Tainan, Taiwan

M.S. in Applied Mathematics, GPA: 4.30/4.30

Sep. 2019 – Jun. 2021

- *Supervisor*: Prof. Ruey-Lin Sheu
- *Thesis*: “On Separation Properties of Quadratic Level/Sublevel Sets and Its Applications”

National Taiwan University (NTU)

Taipei, Taiwan

B.S. in Mathematics, GPA: 4.16/4.30

Sep. 2015 – Jun. 2019

EXPERIENCE

Apple Inc.

Seattle, United States

Machine Learning Intern (AI/ML DMLI Forecasting)

June 2025 - Sep. 2025

- Pioneered hierarchical forecasting for iPhone demand and investigated benefits of hierarchical reconciliation towards target level forecast accuracy
- Delivered mathematical explanation for MinTrace reconciliation alongside rigorous experimental comparisons against Bottom-Up
- Designed and merged a hierarchical forecasting module into the team’s ML pipeline
- Showcased accuracy improvement in the team’s monthly review to senior leadership

PUBLICATIONS

8. **Ya-Chi Chu**, Wenzhi Gao, Yinyu Ye, and Madeleine Udell. [Gradient Methods with Online Scaling Part II. Practical Aspects](#). arXiv:2509.11007.
7. Wenzhi Gao, **Ya-Chi Chu**, Yinyu Ye, and Madeleine Udell. [Gradient Methods with Online Scaling Part I. Theoretical Foundations](#). arXiv:2505.23081
6. **Ya-Chi Chu**, Luiz-Rafael Santos, and Madeleine Udell. (2026) [Randomized Nyström Preconditioned Interior Point-Proximal Method of Multipliers](#). *SIAM Journal on Scientific Computing* 48 (1), A132-A159.

5. **Ya-Chi Chu**, Wenzhi Gao, Yinyu Ye, and Madeleine Udell. (2025) [Provable and practical online learning rate adaptation with hypergradient descent](#). Proceedings of the 42nd International Conference on Machine Learning, PMLR 267:10768-10800, 2025.
4. Wenzhi Gao, **Ya-Chi Chu**, Yinyu Ye, and Madeleine Udell. (2025) [Gradient Methods with Online Scaling](#). Proceedings of Thirty Eighth Conference on Learning Theory, PMLR 291:2192-2226, 2025.
3. **Ya-Chi Chu**, and Alice Cortinovis. (2025) [Improved bounds for randomized Schatten norm estimation of numerically low-rank matrices](#). *Linear Algebra and its Applications* 717, 68-93.
2. Nguyen, H. Q., **Chu, Y. C.**, & Sheu, R. L. (2023). [Separating disconnected quadratic level sets by other quadratic level sets](#). *Journal of Global Optimization* (2023) 88 (4), 1-27.
1. Nguyen, H. Q., **Chu, Y. C.**, & Sheu, R. L. (2021). [On the convexity for the range set of two quadratic functions](#). *Journal of Industrial and Management Optimization* (2020) 18(1), 575-592.

TALKS AND POSTERS

International Conference on Machine Learning 2025 , Vancouver, Canada <i>Provable and practical online learning rate adaptation with hypergradient descent</i>	2025
Conference on Learning Theory 2025 , Leon, France <i>Gradient Methods with Online Scaling</i>	2025
INFORMS Annual Meeting , Seattle, U.S. <i>Fast regularized interior method for large scale separable convex quadratic programming</i>	2024
National Cheng Kung University , Tainan, Taiwan <i>Fast Regularized Interior Point Method for Large Scale Separable Convex Quadratic Programs</i>	2024
International Symposium on Mathematical Programming , Montréal, Canada <i>Randomized Nyström Preconditioned Interior Point-Proximal Method of Multipliers (IP-PMM)</i>	2024
Seminários de Otimização , Unicamp, Brazil (Online) <i>Nyström Preconditioned Interior Point-Proximal Method of Multipliers</i>	2023
Winter Workshop on Optimization , Taipei, Taiwan <i>Checkable conditions for convexity of joint numerical range of two quadratic functions.</i>	2019

SCHOLARSHIPS AND AWARDS

The Sunseri Fellowship , Stanford University	2021
Dean's Award for Graduates , National Taiwan University <i>(for top 6 graduates in the department)</i>	2019
Xiao Fellowship , National Taiwan University <i>(for college student with great potential in mathematics)</i>	2018
Presidential Award , National Taiwan University <i>(for top 3 students of class in the semester)</i>	Fall 2017, Spring & Fall 2018
Zhang-Yang Fellowship , National Taiwan University <i>(for excellent college student majoring in mathematics)</i>	2016

ACADEMIC PROGRAMS

MSRI Summer School - Sums of Squares Method in Geometry, Combinatorics and Optimization (*Cancelled due to Covid-19*)

Mathematical Sciences Research Institute (MSRI), Berkeley, California. July 2020.

Learn-By-Doing Program for Advanced Theory and Application on Mathematical Optimization (*Cancelled due to Covid-19*)

Niigata University, Niigata, Japan. February 2020.

2018 Statistical Science Camp

Academia Sinica, Taipei, Taiwan. September 2018.

SKILLS

- **Highlighted Domain Fields:** Large Language Model (LLM) Applications, Machine Learning (ML), Deep Learning (DL), Optimization (theory/algorithms), Statistics, Mathematical Modelling, Numerical Linear Algebra, Scientific Computing
- **Programming Languages:** Python (PyTorch, Scipy, Scikit-Learn, DeepXDE etc.), C++, R, Matlab, Julia, LaTeX
- **Languages:** Mandarin Chinese (native), English (fluent)