

# Ya-Chi Chu

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“Ya-Chi is a PhD candidate at Stanford University studying applied math and looking for opportunities in AI/ML research roles.”

## Education

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### Stanford University

PH.D. IN MATHEMATICS - GPA: 4.025/4.00

Stanford, CA, U.S.

Sep. 2021 - PRESENT

- **Supervisors:** Prof. Madeleine Udell and Prof. Lexing Ying
- **Research direction:** Optimization algorithms for large-scale ML, Physics-informed ML, Deep Learning, Online Learning, Scientific computing

### National Cheng Kung University

M.S. IN APPLIED MATHEMATICS - GPA: 4.30/4.30

Tainan, Taiwan

Sep. 2019 - June 2021

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

### National Taiwan University

B.S. IN MATHEMATICS - GPA: 4.16/4.30 (GRADUATED WITH DEAN'S AWARD)

Taipei, Taiwan

Sep. 2015 - June 2019

## Experience

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### Stanford University

RESEARCH ASSISTANT (LAB OF PROF. MADELEINE UDELL)

Stanford, CA, U.S.

Jan. 2023 - PRESENT

- Improved training process for physics-informed neural networks and operator learning through multi-stage training
- Designed online learning adaptive scaling for gradient-based optimization algorithms to accelerate large-scale training in ML and deep learning
- Accelerated iterative linear system solvers in interior-point methods using low-rank approximations for quadratic optimization problems
- Developed an AI-driven oral assessment platform utilizing Socratic questioning to enhance critical thinking and communication skills
- Accelerated state-of-the-art iterative eigenvalues solvers via randomization on large sparse matrices with applications in turbulent flows

### Apple Inc.

MACHINE LEARNING INTERN (AI/ML DMLI FORECASTING)

Seattle, WA, U.S.

June 2025 - September 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

## Skills

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**Highlighted Domain fields:** LLM Applications, Machine Learning (ML), Deep Learning (DL), Optimization (theory/algorithms), Statistics, Mathematical Modelling, Scientific Computing, Numerical Linear Algebra

**Programming Languages:** Python (PyTorch, Scipy, Scikit-Learn, DeepXDE etc.), C++, R, Matlab, Julia, LaTeX

## Publications

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- **Ya-Chi Chu**, Wenzhi Gao, Yinyu Ye, and Madeleine Udell. [Provable and practical online learning rate adaptation with hypergradient descent](#). International Conference on Machine Learning 2025 (ICML).
- Wenzhi Gao, **Ya-Chi Chu**, Yinyu Ye, and Madeleine Udell. [Gradient Methods with Online Scaling](#). Conference on Learning Theory 2025 (COLT).
- Wenzhi Gao, **Ya-Chi Chu**, Yinyu Ye, and Madeleine Udell. [Gradient Methods with Online Scaling Part I. Theoretical Foundations](#). arXiv:2505.23081
- **Ya-Chi Chu**, Luiz-Rafael Santos, and Madeleine Udell. [Randomized Nyström Preconditioned Interior Point-Proximal Method of Multipliers](#). Accepted by *SIAM Journal on Scientific Computing* (2025).
- **Ya-Chi Chu**, and Alice Cortinovis. [Improved bounds for randomized Schatten norm estimation of numerically low-rank matrices](#). *Linear Algebra and its Applications* (2025) 717, 68-93.

## Honors & Awards

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2021 **The Sunseri Fellowship**, Stanford University

Stanford, CA, U.S.

2014 **1st Place (with US\$ 20,000 scholarship)**, Shing-Tung Yau High School Mathematics Award

Taipei, Taiwan