

Chih-Yu Chang

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RESEARCH INTERESTS

Intersection of **optimization & statistics**, focused on **collaboration, prediction** and **interpretability**.

EDUCATION

Master Program in Applied Statistics GPA: 3.77/4.0
University of Michigan, Ann Arbor (UMICH)

Michigan, U.S.A.
Aug. 2023 - Dec. 2024

- Statistics Courses: Regression Anal., Bayesian Data Anal., Prob. Theory, Statistical Theory
- Optimization Courses: Continuous Optimization Method, Adv. Bayesian Data Science, Nonlinear Programming

Bachelor of Science in Mathematics
National Tsing Hua University (NTHU)

Hsinchu, Taiwan
Sep. 2019 - Jun. 2023

- Advanced Statistics Courses: Linear Model, Discrete Analysis, Stat. Computing, Stat. Learning.

PUBLICATIONS

Bootstrap Aggregation for Regression Problems via Generalized Least Squares
Chih-Yu Chang and Ming-Chung Chang (submitted)

- Developed a new aggregation method for combining regressors using generalized least squares.

xCBO: Cross-Context Insights for Enhanced Context-Dependent Solutions
Chih-Yu Chang and Raed Al Kontar (ongoing)

- Developing a framework for combining insights of optimal regions from different sources.
- Demonstrated the framework's effectiveness by outperforming existing methods through numerical simulations.
- Applying the proposed algorithm to optimize the quality of solar cell manufacturing.

LLMIBO: Large Language Model-Informed Bayesian Optimization
Chih-Yu Chang and Raed Al Kontar (ongoing)

- Developing a framework for LLM to perform Bayesian optimization with foundation models.
- Enabling contexts like problem formulation involved in Bayesian optimization.
- Applying the proposed algorithm to stabilize 3D printing.

WORK EXPERIENCES

Institute of Statistical Science, Academia Sinica | *Visiting Scholar*
UMICH Data Science Lab | *Research Assistant*

May. 2024 - Aug. 2024
Jan. 2024 - Now

- Conducting research in **Optimization** and **Federated Learning** under Prof. Raed Al Kontar's supervision.

Institute of Statistical Science, Academia Sinica | *Research Assistant*

Mar. 2022 - Aug. 2023

- Did research in improving predictive power for **multi-agent system** advised by Dr. Ming-Chung Chang.

Department of Mathematics, NTHU | *Teaching Assistant*

Sep. 2022 - Jul. 2023

- Became a Teaching Assistant of Calculus I and II offered to 140 international students.

PROJECTS

An Investigation of Adaptive Stepsize Quasi-Newton Methods on ML Tasks
Advisors: Professor Albert Berahas

Apr. 2024

- Developed three novel approaches to prevent overfitting when training ML using Quasi-Newton Methods.
- Successfully reduced the testing error in both regression and classification problems and awarded **Best Project**.

Equilibrium and Data-analytics Laboratory (adviser: Professor Yu-Ching Lee)

Sep. 2021

- Compared different optimization algorithms used in solving online fish market problem using Python.

AWARDS

- **Government Scholarship for Studying Abroad.** 2023-2025 Ministry of Education, Taiwan
- **Special Education Student Award Grant.** 2020, 2021, and 2022 NTHU, Taiwan
- **Adjunct Research Grant.** 2022-2023 Institute of Statistical Science, Academia Sinica

SKILLS

- Languages: English (fluent), Chinese (native)
- Programming: Python, R (Both are able to conduct research and perform data analysis)
- Tools: SQL, Power BI (entry-level)

References

- Dr. Ming-Chung Chang: mcchang@stat.sinica.edu.tw.
Associate Research Fellow, Institute of Statistical Science, Academia Sinica
- Prof. Raed Al Kontar: alkontar@umich.edu.
Associate Professor, Department of Industrial and Operations Engineering, University of Michigan, Ann Arbor.
- Prof. Jyh-Haur Teh: jyhaur@math.nthu.edu.tw.
Professor, Department of Mathematics, National Tsing Hua University.