

FENG-YI LIAO

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EDUCATION

University of California, San Diego Ph.D., Electrical and Computer Engineering (Intelligent Systems, Robotics & Control) Advisor: Prof. Yang Zheng	La Jolla, CA, U.S.A. Sep. 2023 – Present
University of California, San Diego M.S., Electrical and Computer Engineering (Intelligent Systems, Robotics & Control)	La Jolla, CA, U.S.A. Sep. 2021 – June. 2023
National Chung Hsing University B.S., Bio-Industrial Mechatronics Engineering	Taichung, Taiwan 2016 – 2020

PUBLICATIONS

Preprint

1. **F.-Y. Liao** and Y. Zheng. Revisiting Proximal Bundle Methods: Improved Rates under Hölder Smoothness. [PDF]
2. W. Yuto, **F.-Y. Liao**, and Y. Zheng. Weak Convexity and Proximal Bundle Methods for Nonsmooth Policy Optimization in Robust Control. [PDF]
3. **F.-Y. Liao** and Y. Zheng. A Proximal Descent Method for Minimizing Weakly Convex Optimization. [PDF]
4. **F.-Y. Liao** and Y. Zheng. A Bundle-based Augmented Lagrangian Framework: Algorithm, Convergence, and Primal-dual Principles. [PDF]

Conference papers

1. W. Yuto, **F.-Y. Liao**, and Y. Zheng. Policy Optimization in Robust Control: Weak Convexity and Subgradient Methods. *2026 American Control Conference (ACC)*, pages 1329-1335, IEEE 2026. [PDF]
2. **F.-Y. Liao**, Thomas Madden, and Y. Zheng. An accelerated proximal bundle method for convex optimization. *Proceedings of The 8th Annual Learning for Dynamics and Control Conference*, PMLR 331:1012-1034, 2026. PDF]
3. **F.-Y. Liao**, L. Ding, and Y. Zheng. Inexact augmented lagrangian methods for conic optimization: Quadratic growth and linear convergence. In *The Thirty-eighth Annual Conference on Neural Information Processing Systems*, 2024. [PDF]
4. **F.-Y. Liao**, L. Ding, and Y. Zheng. Error bounds, PL condition, and quadratic growth for weakly convex functions, and linear convergences of proximal point methods. In *6th Annual Learning for Dynamics Control Conference*, volume 242 of *Proceedings of Machine Learning Research*, pages 993–1005. PMLR, 2024. [PDF]
5. H. Mojtahedi, **F.-Y. Liao**, and Y. Zheng. A spectral bundle method for sparse semidefinite programs. In *2023 62nd IEEE Conference on Decision and Control (CDC)*, pages 8254–8259, 2023. [PDF]
6. **F.-Y. Liao** and Y. Zheng. Iterative inner/outer approximations for scalable semidefinite programs using block factor-width-two matrices. In *IEEE 61th Annual Conference on Decision and Control (CDC)*, pages 7591–7597, IEEE 2022. [PDF][CODE]

Journal

1. **F.-Y. Liao**, L. Ding, and Y. Zheng. Error bounds, PL condition, and quadratic growth for weakly convex functions, and linear convergences of proximal point methods. *Journal of Global Optimization*, 2026. [PDF]
2. **F.-Y. Liao**, L. Ding, and Y. Zheng. An Overview and Comparison of Spectral Bundle Methods for Primal and Dual Semidefinite Programs. *Computational Optimization and Applications*, 2025. [PDF][CODE]
3. A. Q. Xu, S. J. Luo, **F. Y., Liao**, I. C. Chen, M. C. Chien, and K. Y. Huang. "Development of a Novel Autoinspection System for Paddy Seed Early-germination Performance," *Sensors and Materials*, vol. 32, no. 11, pp. 3647-3657, 2020. [PDF]

INVITED/CONFERENCE PRESENTATIONS

A Bundle-based Augmented Lagrangian Framework: Algorithm, Convergence, and Primal-dual Principles

- 2025 International Conference on Continuous Optimization (ICCOPT), Los Angeles, California July. 2025

Inexact augmented lagrangian methods for conic programs: Quadratic growth and linear convergence

- NeurIPS 2024, Vancouver, Canada Dec. 2024

Error bounds, PL condition, and quadratic growth for weakly convex functions, and linear convergences of proximal point methods

- 25th International Symposium on Mathematical Programming (ISMP), Montréal, Canada July. 2024

Spectral Bundle Methods for Primal and Dual Semidefinite Programs

- INFORMS Optimization Society Conference, Houston, Texas March. 2024
- UCSD Optimization and Data Science Seminar, San Diego, California Nov. 2023
- INFORMS Annual Meeting, Phoenix, Arizona October. 2023

Iterative inner/outer approximations for scalable semidefinite programs using block factor-width-two matrices

- 61st IEEE Conference on Decision and Control, Cancún, Mexico Dec. 2022

RESEARCH EXPERIENCES

Scalable Optimization and Control (SOC) Lab, UCSD

Oct. 2021 – Present

Advisor: Prof. Yang, Zheng

- Designing **accelerated** proximal bundle methods
- Analyzing the **proximal bundle method** for **weakly convex** optimization
- Investigating the connections between classical first-order methods, including the **proximal bundle method**, the **augmented Lagrangian method**, the **proximal point method**, and the **Frank-Wolf method**
- Investigating the equivalence on common **regularity conditions** in optimization, such as strong convexity, restricted secant inequality, error bound, **Polyak-Łojasiewicz inequality**, and **quadratic growth**
- Designing and analyzing **spectral bundle method** for semidefinite programs

REVIEWERS FOR JOURNALS/CONFERENCES

- NeurIPS, 2025, 2026
- Journal of Optimization Theory and Application, 2026
- Optimization, 2026
- IEEE Transactions on Control of Network Systems, 2025
- Mathematical Programming, 2025
- Journal of Optimization Theory and Applications, 2024, 2026
- 62th, 63th, and 65th IEEE Conference on Decision and Control

TEACHING EXPERIENCE

Teaching Assistant at University of California, San Diego

- Fall 2026 ECE 045 - Circuit and System
- Winter 2025 ECE 285 - Semidefinite and Sum-of-squares Optimization
- Winter 2023 ECE 285 - Semidefinite and Sum-of-squares Optimization
- Spring 2023 ECE 171A - Linear Control System Theory

AWARDS

- Travel and workshop support award for NeurIPS 2024
- Informs poster presentation award,
Operations Research and Optimization Methodologies Category Winner 2023

- Student travel and workshop support award for IEEE CDC 2022
- NCHU Golden Key award (top 5% of class) 2020
- Second place award, smart agricultural robotic competition 2019
- NCHU Ching-O award, NCHU (top 5% of class) 2019
- NCHU Academic Excellence award (top 10% of class) 2018