

# MEIXIA LIN

Engineering Systems and Design, Singapore University of Technology and Design

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<https://linmeixia.github.io/>

## RESEARCH INTEREST

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- Algorithm design for large-scale optimization problems in data science
- Convex regression problems
- Signal processing
- Stochastic optimization

## EMPLOYMENT

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**Engineering Systems and Design,  
Singapore University of Technology and Design**

*Jun. 2022 - Present*

- Assistant Professor

**Institute of Operations Research and Analytics,  
National University of Singapore**

*Jun. 2021 - May. 2022*

- Research Fellow
- Mentors: Professor Kim-Chuan Toh

**Department of Mathematics,  
National University of Singapore**

*Nov. 2020 - May. 2021*

- Research Fellow
- Mentors: Professor Kim-Chuan Toh, Professor Subhroshekhar Ghosh

**CriAT–Deep Credit Analytical Technologies, Singapore**

*May. 2019 - Jul. 2019*

- Research Intern

## EDUCATION

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**National University of Singapore, Singapore**

*Aug. 2016 - Oct. 2020*

- Ph.D. in Department of Mathematics
- Supervisors: Professor Kim-Chuan Toh, Professor Chao Zhou
- Thesis: Efficient Second-order Algorithms for Structured Convex Composite Programming

**Nanjing University, China**

*Sep. 2012 - Jun. 2016*

- B.S. in Information and Computing Science

## PUBLICATIONS IN REFEREED SCIENTIFIC JOURNALS

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<sup>†</sup> equal contribution or alphabetical order; \* corresponding author.

1. Zhenning Cai, Bo Lin\*, and **Meixia Lin**, “A positive and moment-preserving Fourier spectral method”, *SIAM Journal on Numerical Analysis*, 2024, Vol. 62(1), pp. 273-294.
2. **Meixia Lin**<sup>†</sup>, Yancheng Yuan<sup>†</sup>, Defeng Sun\*, and Kim-Chuan Toh, “A highly efficient algorithm for solving exclusive lasso problems”, *Optimization Methods and Software*, 2023, pp. 1–30.

3. Subhroshekhar Ghosh, **Meixia Lin**<sup>\*</sup>, and Dongfang Sun, “Signal analysis via the stochastic geometry of spectrogram level sets”, *IEEE Transactions on Signal Processing*, 2022, Vol. 70, pp. 1104–1117.
4. **Meixia Lin**<sup>\*</sup>, Defeng Sun, and Kim-Chuan Toh, “An augmented Lagrangian method with constraint generation for shape-constrained convex regression problems”, *Mathematical Programming Computation*, 2021, Vol. 14, pp. 223–270.
5. **Meixia Lin**, Yong-Jin Liu<sup>\*</sup>, Defeng Sun, and Kim-Chuan Toh, “Efficient sparse semismooth Newton methods for the clustered lasso problem”, *SIAM Journal on Optimization*, 2019, Vol. 29(3), pp. 2026–2052.

## PUBLICATIONS IN CONFERENCE PROCEEDINGS

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<sup>†</sup> equal contribution or alphabetical order; <sup>\*</sup> corresponding author.

1. **Meixia Lin**, and Yangjing Zhang<sup>\*</sup>, “DNNLasso: Scalable graph learning for matrix-variate data”, International Conference on Artificial Intelligence and Statistics (AISTATS), 2024.
2. Rémi Bardenet<sup>†</sup>, Subhroshekhar Ghosh<sup>†\*</sup>, and **Meixia Lin**<sup>†\*</sup>, “Determinantal point processes based on orthogonal polynomials for sampling minibatches in SGD”, Conference on Neural Information Processing Systems (NeurIPS), 2021. (**Spotlight** presentation, less than 3% acceptance rate)

## PREPRINTS

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<sup>†</sup> equal contribution or alphabetical order; <sup>\*</sup> corresponding author.

1. **Meixia Lin**, Ziyang Zeng, and Yangjing Zhang<sup>\*</sup>, “Multivariate regression for matrix and vector predictors: Models, theory, algorithms, and beyond”, submitted, May 2024.
2. Hong T. M. Chu, **Meixia Lin**<sup>\*</sup>, and Kim-Chuan Toh, “Wasserstein distributionally robust optimization and its tractable regularization formulations”, submitted, May 2024.
3. Chengjing Wang, Peipei Tang<sup>\*</sup>, Wenling He, and **Meixia Lin**, “Learning the hub graphical model with the structured sparsity via an efficient algorithm”, submitted, February 2024.
4. Yancheng Yuan<sup>†</sup>, **Meixia Lin**<sup>†\*</sup>, Defeng Sun, and Kim-Chuan Toh, “Adaptive sieving: A dimension reduction technique for sparse optimization problems”, submitted, June 2023 (Revised April 2024).
5. **Meixia Lin**, Defeng Sun, Kim-Chuan Toh, and Chengjing Wang<sup>\*</sup>, “Estimation of sparse Gaussian graphical models with hidden clustering structure”, submitted, April 2020 (Revised April 2023).

## RESEARCH GRANTS

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- Principal Investigator, MOE Academic Research Fund Tier 2 (2024-2027), SGD \$680k.
- Principal Investigator, TL@SUTD Seed Research Project Grant (2023-2024), SGD \$96k.
- Principal Investigator, SUTD Kickstarter Initiative (2022-2025), SGD \$477k.

## TEACHING EXPERIENCES

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### Singapore University of Technology and Design

- 40.319 Statistical and Machine Learning *Spring 2023*
- 10.022 Modelling Uncertainty *Autumn 2022, Autumn 2023*
- 40.016 The Analytics Edge *Summer 2022*

### National University of Singapore

- Teaching Assistant *Aug. 2017 - May. 2020*

## GRADUATE STUDENT SUPERVISION

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### Graduate Students

- Mr Zhihao Liu, PhD candidate at SUTD, September 2023 –

### Postdocs and Research Assistants

- Dr Wenhao Lu, Postdoc, at Singapore University of Technology and Design, Singapore
- Dr Xiaoyu Dong, Postdoc, May 2024 –, at Singapore University of Technology and Design, Singapore
- Mr Tirtho Sarker, Research Assistant, March 2024 –, at Singapore University of Technology and Design, Singapore
- Dr Qian Zhang, Postdoc, September 2023 –, at Singapore University of Technology and Design, Singapore

### Visiting Scholars

- Miss Mengjiao Shi, Visiting PhD Student from August 2024 – February 2025, at Singapore University of Technology and Design, Singapore
- Associate Professor Sisi Zheng, Visiting Scholar from Huizhou University under the support of the Chinese Scholar Council (CSC), March 2024 – January 2025, at Singapore University of Technology and Design, Singapore
- Mr Ziyang Zeng, Visiting Master Student from National University of Singapore, September 2023 – September 2024, at Singapore University of Technology and Design, Singapore
- Mr Jiawei Gu, Visiting PhD Student from Nanjing University of Science and Technology, October 2023 – April 2024, at Singapore University of Technology and Design, Singapore
- Miss Chu Thi Mai Hong, Visiting PhD Student from National University of Singapore, March 2023 – April 2023, at Singapore University of Technology and Design, Singapore

## CONSULTING PROJECT

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### Tokopedia

*Jan. 2022 - Oct. 2023*

## PROFESSIONAL ACTIVITIES

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### Minisymposium Organizer in International Conferences

- Chair, Minisymposium on “Recent Advances in Structured Non-Smooth Optimization” (virtual), SIAM Conference on Optimization 2021 (OP21), Jul. 20–23, 2021.

### Invited Talks

- “*Sampling minibatches in SGD – A DPP based approach via Orthogonal Polynomials*”, 10th International Congress on Industrial and Applied Mathematics, Tokyo, Japan, Aug. 20–25, 2023.
- “*Sampling minibatches in SGD – A DPP based approach via Orthogonal Polynomials*”, Workshop on Optimization in the Big Data Era, Singapore, Dec. 05–16, 2022.
- “*Signal analysis via the stochastic geometry of spectrogram level sets*”, Workshop on Determinantal and Permanent Point Processes, Quantum Physics, and Signal Processing, Lyon, France, May. 30–Jun. 10, 2022.
- “*Estimation of sparse Gaussian graphical models with hidden clustering structure*” (virtual), SIAM Conference on Optimization 2021 (OP21), Jul. 20–23, 2021.
- “*Adaptive sieving with PPDNA: Generating solution paths of exclusive lasso models*” (virtual), Forum on Operations Research and Information 2020, Beijing, China, Nov. 23–26, 2020.

- “*Efficient sparse semismooth Newton methods for the clustered lasso problem*”, Workshop on Matrix Optimization 2019, Beijing, China, Nov. 29–30, 2019.
- “*A dual Newton based preconditioned proximal point algorithm for exclusive lasso models*”, The Sixth International Conference on Continuous Optimization, Berlin, Germany, Aug. 3–8, 2019.
- “*Efficient sparse semismooth Newton methods for the clustered lasso problem*”, International Symposium on Mathematical Programming 2018, Bordeaux, France, Jul. 1–6, 2018.

## SERVICES

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### Committee Services (in ESD, SUTD)

- Research And Scholarly Excellence (RASE) Committee
- Taskforce to review AI in ESD curriculum
- **Focus Track Lead** of Business Analytics and Operations Research
- Admissions Selection Committee
- Outreach (Workshop/Talk)
- Capstone Scoping
- SHARP Interviews/Supervision

### University Services

- **Vice president** of NUS SIAM Student Chapter, Jul. 2019 – Jun. 2020.

## HONORS AND AWARDS

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- **Best Graduate Researcher Award** in Department of Mathematics, NUS, Singapore, 2020.
- Outstanding Graduate Award, Nanjing University, China, 2016.
- First-class Scholarship of Top-notch Student Training Plan, China, 2015.
- First-class People’s Scholarship, China, 2014.
- **National Scholarship**, China, 2013.