# Tianyi Liu

*M.Sc.*

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## Education

2018–present **Ph.D. Electrical Engineering and Information Technology**, *Technical University of Darmstadt*, Darmstadt, Germany
Doctorate Advisor: Prof. Marius Pesavento

2016–2018 **M.Sc. Electrical Engineering and Information Technology**, *Technical University of Darmstadt*, Darmstadt, Germany, **Grade:** *1.16 with honors*
Erasmus Double Degree Program
**Thesis title:** A Scalable Graph-based Mixed-Integer Linear Programming Approach for the Examination Timetabling Problem

2015–2018 **M.Sc. Communications and Computer Networks Engineering**, *Politecnico di Torino*, Turin, Italy, **Grade:** *110/110 cum laude*

2014–2015 **B.Sc. Telecommunications Engineering**, *Politecnico di Torino*, Turin, Italy, **Grade:** *109/110*
Double Degree Program PoliTong
Project: Software Development for Constellation Optimization

2011–2015 **B.Eng. Electronics and Information Engineering**, *Tongji University*, Shanghai, China, **Grade:** *4.58/5*

## Experience

2018–present **Research Assistant**, *Communication Systems Group, Technical University of Darmstadt*, Darmstadt, Germany

## Research Interests

- Sparse Signal Processing
- Parallel Optimization Methods
- Array Signal Processing
- Graph Topology Inference

## Honors and Awards

2018 **Best Student Award**, *Department of Electrical Engineering and Information Technology, Technical University of Darmstadt*, Darmstadt, Germany

## Publications

### Book Chapters

[1] K. Ardah, M. Haardt, T. Liu, F. Matter, M. Pesavento, and M. E. Pfetsch, "Recovery under side constraints," in *Compressed sensing in information processing* (G. Kutyniok, H. Rauhut, and R. J. Kunsch, eds.), pp. 213–246, Cham: Springer International Publishing, 2022.

### Journal Articles

[2] T. Liu, A. M. Tillmann, Y. Yang, Y. C. Eldar, and M. Pesavento, "Extended successive convex approximation for phase retrieval with dictionary learning," *IEEE Transactions on Signal Processing*, vol. 70, pp. 6300–6315, 2022.

### Preprints

[3] T. Liu, F. Matter, A. Sorg, M. E. Pfetsch, M. Haardt, and M. Pesavento, "Joint sparse estimation with cardinality constraint via mixed-integer semidefinite programming," Nov. 2023.

### Conference Proceedings

[4] T. Liu, M. T. Hoang, Y. Yang, and M. Pesavento, "A block coordinate descent algorithm for sparse Gaussian graphical model inference with laplacian constraints," in *IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing*, pp. 236–240, Dec. 2019.

[5] T. Liu, S. P. Deram, K. Ardah, M. Haardt, M. E. Pfetsch, and M. Pesavento, "Gridless parameter estimation in partly calibrated rectangular arrays," in *ICASSP 2024 - 2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 8796–8800, Apr. 2024.

[6] T. Liu, F. Matter, A. Sorg, M. E. Pfetsch, M. Haardt, and M. Pesavento, "Joint sparse estimation with cardinality constraint via mixed-integer semidefinite programming," in *2023 IEEE 9th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, (Herradura, Costa Rica), pp. 106–110, Dec. 2023.

[7] T. Liu, A. M. Tillmann, Y. Yang, Y. C. Eldar, and M. Pesavento, "A parallel algorithm for phase retrieval with dictionary learning," in *IEEE International Conference on Acoustics, Speech and Signal Processing*, pp. 5619–5623, June 2021.

[8] T. Liu, M. T. Hoang, Y. Yang, and M. Pesavento, "A parallel optimization approach on the infinity norm minimization problem," in *2019 27th European Signal Processing Conference (EUSIPCO)*, (A Coruna, Spain), pp. 1–5, IEEE, Sept. 2019.

[9] X. Wang, T. Liu, M. Trinh-Hoang, and M. Pesavento, "GPU-accelerated parallel optimization for sparse regularization," in *2020 IEEE 11th Sensor Array and Multichannel Signal Processing Workshop (SAM)*, pp. 1–5, June 2020.

[10] Y. Zhang, T. Liu, and M. Pesavento, "Direction-of-arrival estimation for correlated sources and low sample size," in *2023 31st European Signal Processing Conference (EUSIPCO)*, pp. 1559–1563, Sept. 2023.