

EDUCATION

Guangdong University of Technology

Master of Control Science and Engineering, GPA: 86.2/100

Guangzhou

2020–2023

- Supervisor: Prof. Haochuan Zhang
- Thesis: “Theory and Application of Nonlinear Distortion High-dimensional Signal Estimation”

Guangdong University of Technology

Bachelor of Automation Control, GPA: 86.1/100

Guangzhou

2016–2020

PUBLICATIONS

Liu, S., Ma, J., (2024). AMP Algorithms for Rotationally-Invariant Models: A Unified Approach via Orthogonal Decomposition. (<https://songice.github.io/files/paper4.pdf>).

Dudeja, R., **Liu, S.**, Ma, J., (2024). Optimality of Approximate Message Passing Algorithms for Spiked Matrix Models with Rotationally Invariant Noise. arXiv preprint arXiv:2405.18081. (Alphabetically ordered, minor revision at Annals of Statistics)

Zhu, H., Huang, L., **Liu, S.**, et al. (2022). REIA: A database for cancer A-to-I RNA editing with interactive analysis. International Journal of Biological Sciences, 18(6), 2472. (Co-first Author)

Liu, S., Zhang, H., et al. (2021). Decentralized channel estimation for the uplink of grant-free massive machine-type communications. IEEE Transactions on Communications, 70(2), 967-979.

EXPERIENCE

Academy of Mathematics and Systems Science, Chinese Academy of Sciences

Research Assistant, Supervisor: Prof. Junjie Ma

Beijing

07/2023-

- Working with Professor Junjie Ma and Professor Rishabh Dudeja on a spiked matrix model with rotationally invariant noise. We developed a new type of approximate message passing (AMP) algorithm for the model and analyzed its behavior in high-dimensional settings. We showed that the algorithm achieves the smallest possible estimation error within a fixed number of iterations
- We developed a unified framework for deriving AMP algorithms applicable to rotationally invariant models, offering greater clarity and flexibility while being easier to adapt to different models and settings. We also introduced a new recursive way of generating the sequence of free cumulants from the sequence of moments

Academy of Mathematics and Systems Science, Chinese Academy of Sciences

Visiting Student, Supervisor: Prof. Junjie Ma

Beijing

02/2023-05/2023

Guangdong University of Technology

Supervisor: Prof. Haochuan Zhang

Guangzhou

09/2020-06/2023

- We designed a EP-type algorithm to implement channel estimation and active user detection in massive machine-type communications.
- We built an RNA database analysis website together with other colleagues, and I was responsible for the development of the website and data processing.

National College Students' innovation and entrepreneurship training program

Guangzhou

Project name: Design, simulation and implementation of SCARA robots (Principal Investigator) 04/2018-04/2020

- The project aims to develop an independently designed SCARA robot system. The research includes mathematical modeling and simulation of the SCARA robot, design and simulation of the path planner, design of the SCARA mechanical arm, and implementation of the control system.

SKILLS

- **Programming Languages:** MATLAB, R, Java, LabVIEW

SCHOLARSHIPS AND AWARDS

- | | |
|---|-----------|
| • National Scholarship for Graduate Students (Top 1%). | 2022 |
| • The First Prize Scholarship (3 times) | 2020-2022 |
| • Top Innovative Talent Program Scholarship, GDUT, | 2021 |
| • Outstanding undergraduate thesis | 2020 |
| • National Encouragement scholarship | 2019 |
| • The First Prize Scholarship | 2019 |