Haolin Chen

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Education

University of California, Davis — Davis, CA
PhD in Applied Mathematics. Advisor: Luis Rademacher. — *Sep. 2017 – Present*

Nankai University — Tianjin, China
Bachelor of Science in Physics and Mathematics — *Sep. 2012 – Jun. 2017*

Work Experience

Graduate Student Researcher — Spring 2019 – present
Research area: high dimensional statistics, foundation of data science and machine learning.

Teaching Assistant — Fall 2017 – Present
Lead discussions, office hours and lectures in multiple undergraduate math courses.

Research Experience

Clinically interpretable thyroid cancer detection via deep neural networks — Fall 2020 – Present

Developing interpretable deep learning based algorithms for clinical diagnosis on thyroid ultrasound images.

Convex geometry of low rank tensor recovery — Summer 2020 – Present
Advisor: Luis Rademacher

Developing theoretical guarantees to extract latent structures from a symmetric order-4 tensor via convex optimization.

Provable tensor methods in high dimensional statistics — Spring 2019 – Spring 2020
Advisor: Luis Rademacher

Developed an efficient and provable algorithm to decompose symmetric overcomplete order-3 tensors, with applications to blind deconvolution and Gaussian mixture learning problems.

Optical properties of PT-symmetric systems — Winter 2015 - Spring 2017
Advisor: Jing Chen

Conducted numerical simulation of optical properties, such as Zitterbewegung effects, in PT-symmetric lattices model. Results provided numerical evidence of novel phenomena in optical lattice.

Research talks

MLSS 2020 — Summer 2020
Poster session: Learning Gaussian mixture models via tensor decomposition

Publications

Preprints

- *Haolin Chen*, Luis Rademacher. Overcomplete order-3 tensor decomposition, blind deconvolution and Gaussian mixture models, *arXiv:2007.08133*.

Journal Articles

- Wei Wang, Luqi Wang, Ruidong Xue, *Haolin Chen*, Ruipeng Guo, Yongmin Liu, and Jing Chen, (2017). Unidirectional Excitation of Radiative-Loss-Free Surface Plasmon Polaritons in PT-Symmetric Systems. *Physical review letters*, 119(7), 077401.
- Ruidong Xue, Wei Wang, Luqi Wang, *Haolin Chen*, Ruipeng Guo, and Jing Chen (2017). Localization and oscillation of optical beams in Moiré lattices. *Optics express*, 25(5), 5788-5796.

Technical Skills

Programming Skills: Python, MATLAB, LaTeX, Tensorflow, PyTorch
Related coursework: Numerical Optimization; Statistical Learning; Math Foundation of Data Sciences; Optimal Transport; Natural Language Processing; Specialization in Deep Learning(Coursera)
Teaching: Calculus; Basic linear algebra; Ordinary differential equations; Probability theory; Applied linear algebra