Chenghui Li

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Education

University of Wisconsin-Madison (WI); *Ph.D.* Statistics — Aug. 2020 – Present

University of Wisconsin-Madison (WI); *M.S.* Statistics — Aug. 2018 – May 2020

- Visiting International Student Academic Excellence Award(twice)

Zhejiang University (Zhejiang, China); *B.S.* Mathematics — Aug. 2015 – June 2019

- Thesis: FFI Algorithm Performance in Bin-packing MinSum Problem
- Qiushi Pursuit Science Class (Chu Kochen Honors Program)
- Visited University of Wisconsin Madison in 2019

Selected Research & Projects

PDE in Adversarial Optimization — Jan. 2021 – Present

Advised by Nicolas Garcia Trillos

- Used PDE to study adversarial optimization problem, and described the geometric property of the solution.
- Designed algorithm for robust version Non-negative least squares problem.

Spectral Clustering — Oct. 2019 – Present

Advised by Nicolas Garcia Trillos

- Derived Spectral universal approximation rate for spectral contrastive learning algorithm.
- Disigned angle-constrained path algorithm to solve multi-manifold clustering problem.

Research Assistant — Feb. 2022 – May. 2022

Optimization Advised by Jelena Diakonikolas

- Proved the convergence rate for Primal Dual Algorithm for linear constrained l_1 minimization problem.

Research Assistant — Jan. 2021 – Jan. 2022

Topological Data Analysis Advised by Jessi Cisewski Kehe

- Used DaC algorithm to make persistent homology algorithm efficient, and develop theoretical guarantees for this algorithm.

Publication and preprint

- A Fast Scale-Invariant Algorithm for Non-negative Least Squares with Non-negative Data; To appear on Neurips 2022, Preprint
- Large sample spectral analysis of graph-based multi-manifold clustering; Preprint

Selected talks and conference

- Assistant for MRC: Data Science at the Crossroads of Analysis, Geometry, and Topology; May 2022.
- FWCG2021: Consistency of spectral multi-manifold clustering (4 Pages Abstract); Oct. 2021

Skills

- **Programming Languages**: Proficient in R, Julia and Matlab, experienced in Python.

Miscellaneous

- **Personal website**: https://chl781.github.io/