CHENYU ZHANG

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OBJECTIVE

To apply for a Ph.D. in Data Science/Machine Learning/Optimization starting in the Fall 2024 semester.

EDUCATION

Columbia University   *2022 - 2023 (expected)*

M.S. in Data Science

Overall GPA: 4.33/4

Relevant Courses

Reinforcement Learning	A+	Algorithms for Data Science	A+
Probability and Statistics for Data Science	A+	Exploratory Data Analysis	A+

Fudan University   *2018 - 2022*

B.S. in Mathematics and Applied Mathematics

Honors Student of Su Buqing Top Talent Program

Overall GPA: 3.54/4

Relevant Courses

Numerical Linear Algebra and Optimization (H)	A	Deep Learning	A
Numerical Solution to Differential Equations	A	Methods of Optimization	A
Functions of Complex Variable	A	Probability Theory	A
An Introduction to Differential Manifolds (H)	A-	Advanced Algebra	A
Computational Thinking	A	Fundamentals of Mechanics	A
College Physics	A		

Relevant Seminars

Intelligent Optimization Algorithms	Convex Optimization
Complex Analysis	Global Differential Geometry
Differential Manifolds and Differential Topology	Differential Geometry of Curves and Surfaces
Non-Euclidean Geometry and Point Set Topology	Principles of Mathematical Analysis
Advanced Mathematical Analysis	

Shenzhen Middle School   *2015 - 2018*

Honor Curriculum (Physics Olympiad)

Award: Chinese Physics Olympiad - First Class Award

WORKING PAPERS

- **Chenyu Zhang,** Han Wang, and James Anderson, *Federated SARSA with Linear Function Approximation under Environmental Heterogeneity.* [In progress]
- **Chenyu Zhang,** Rufeng Xiao, and Rujun Jiang, *A Trust-Region Method based Augmented Lagrangian Method for Nonsmooth Optimization on Riemannian Manifolds.* [Ready to submit]
- **Chenyu Zhang,** Qi Cai, Zhuoran Yang, and Zhaoran Wang, *On Reward-Free Reinforcement Learning for POMDPs with Linear Function Approximation.* [Ready to submit]

RESEARCH EXPERIENCE

Federated Reinforcement Learning
September 2021 - Present
Research assistant, advised by Prof. James Anderson of Dept. EE, Columbia University, NY

- Designed a federated SARSA algorithm, and established its finite-time error bounds and linear convergence speedups under environmental heterogeneity.

Manifold Nonsmooth Nonconvex Optimization
October 2021 - September 2022
Research assistant, advised by Prof. Rujun Jiang of Dept. Data Science, Fudan University, China

- Designed a semismooth Riemannian trust-region method based augmented Lagrangian method for nonsmooth nonconvex optimization problems on manifolds, and established its convergence results.
- Established a state-of-the-art iteration complexity of the semismooth Riemannian trust-region method.

Reinforcement Learning for POMDPs
March 2021 - January 2022
Research assistant, advised by Prof. Zhaoran Wang, Dept. of IEMS&CS, Northwestern University, IL
Co-advised by Prof. Zhuoran Yang, Dept. of Stat&Data Science, Yale University, CT

- Designed a reward-free algorithm for tabular POMDPs and established its sample efficiency guarantee.
- Designed a sample-efficient reward-free algorithm for linear POMDPs.

RELEVANT PROJECTS

Course Projects: Exploratory Data Analysis and Visualization
September 2022 - December 2022

- Created a digital garden for EDAV to learn in public: *EDAV Garden*.
- Conducted a research on music reviews and streams using R and JavaScript: *Review vs Stream*.

Internship: Database Migration and Deployment of OA Systems
July 2021 - September 2021
Database developer intern, jointly supervised by Shanghai Weaver Network and Shenzhen Sine Electric

- Migrated the old OA system's SQL Server database and deployed it as a MySQL database for the new OA system.
- Extended the functionalities of existing workflows, such as automated email delivery and single sign-on, by developing many hooks.

Course Project: Introduction to Databases Systems
February 2021 - June 2021

- Built an interactive library database web application using Flask and PostgreSQL: *Salt Library*.

Mathematical Contest In Modeling 2021
February 2021

- Designed a fast-response UAV firefighting system based on the genetic algorithm and implemented it in MATLAB.

SCHOLARSHIP & AWARD

Honors Student of Top Talent Program	*2022*
Undergraduate Merit Scholarship - Third Class Award	*2019-2020, 2020-2021, 2021-2022*
Undergraduate Major Scholarship	*2018-2019, 2019-2020, 2020-2021*
The Chinese Mathematics Competitions - Second Class Award	*2019*
The Chinese Physics Competitions - Second Class Award	*2019*
Undergraduate Merit Scholarship - Second Class Award	*2018-2019*
Freshman Scholarship	*2018*