Qiming Cui

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CANDIDATE INFORMATION

- 4th year Ph.D. Candidate in Applied Mathematics and Statistics, Johns Hopkins University
- Research group: Algorithms and Complexity (CS Theory group)
- Research focus: Approximation and Online Algorithms with Machine-Learned Predictions

EDUCATIONAL BACKGROUND

Johns Hopkins University **August 2022 –**
Doctor of Philosophy in Applied Math and Statistics *Adviser: Dr. Michael Dinitz*

University of Oxford **September 2021 – June 2022**
Master of Science in Mathematical Sciences *Graduate with Merit*

University of Liverpool **September 2017 – June 2021**
Bachelor of Science with Honours in Mathematics (First Class) *GPA: 4.0/4.0*

RELEVANT COURSEWORK

- Algorithms
- Approximation Algorithms
- Machine Learning
- Probability Theory
- Statistics Theory
- Convex Optimization
- Continuous Optimization
- Combinatorial Optimization
- Matrix Analysis
- Real Analysis
- Numerical analysis
- Data Science

RESEARCH PROJECT EXPERIENCES

Densest subgraph problem with fractional predictions **July 2025 –**

- Developing learning-augmented algorithms to efficiently obtain suboptimal subgraphs under fractional predictions

Ski rental with distributional predictions **August 2024 – June 2025**

- Designed learning-augmented algorithms to the classical ski rental problem with any distributional prediction
- Provided high level bounds and proved graceful degradation of algorithm performance with unknown increasing error
- Showed robustness of the algorithm and proved better performance compared to the state-of-the-art algorithm

Controlling tail risk in two-slope ski rental **September 2023 – July 2024**

- Paper accepted at Approximation and Online Algorithms (WAOA 2025) and invited to special issue of Acta Informatica
- Developed technical theorems to fully understand the structure of optimal solution(s) for the problem
- Designed two algorithms to compute the optimal solution(s) for the problem

β-expansions **January 2021 – June 2021**

- Finished a long report about theorems and properties of β-expansions from dynamical systems viewpoint
- Exploited the number of G-expansions, established a sophisticated theorem and gave a five page formal proof
- Studied Uniqueness expansions of points, provided new proofs of lemmas and theorems

PROFESSIONAL SKILLS

- Programming Languages: Python (Pandas, Numpy), Java
- Office Tools:Microsoft Office (Excel, Word, PowerPoint), Google Workspace (Docs, Sheets, Slides)
- Math Tools: LaTeX, MATLAB
- Currently learning: SQL, Tableau, C++

HONORS AND AWARDS

- Bronze medal in 28^{th} International Mathematics Competition for University Students
- The Advance of Algorithm Contest in the Second Round on the Rank List of Facebook Hacker Cup
- 2019-2020, 2020-2021 University of Liverpool Excellence Scholarship (1/320)
- 2019 Summer Undergraduate Research Fellowship

EXTRACURRICULAR / ACADEMIC SERVICE

- Teaching Assistant in Numerical linear Algebra, Approximation Algorithms from 2022
- University of Oxford Mathematics Admission Test (MAT) Grader

HOBBIES AND INTERESTS

- Playing the piano, listening to music, reading
- Travelling the world, hiking, running, playing ball games