Dao Chen Yuan

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Education

University of Waterloo — Waterloo, ON
MMath Combinatorics and Optimization, supervised by Prof. Penny Haxell. — 2022 – 2024

McGill University — Montreal, QC
B. Sc. Honours Probability and Statistics, Minor in Computer Science, GPA: 3.98/4.00. — 2019 – 2022

Projects

- **Spectral Gaps and Graph Polynomials for Regular Graphs** — May 2021 – Dec 2021
  NSERC-sponsored project supervised by Prof. Dmitry Jakobson[1]. Studied spectral behaviour of large regular graphs and properties of their chromatic polynomial. Continuing the research into Fall 2021 co-supervised by Prof. Sergey Norin[2]. Read my summer notes here and my final report here.

- **Study on Generation and Properties of Fractals** — 2018 – 2019
  Reading project supervised by Prof. Jakobson and teamed with another student. Studied real analysis results related to generation and properties of fractals (iterated function systems, Hausdorff dimension and measure, etc). Authored final paper and gave presentation. Read our report here.

Academic Coursework

- **Analysis:** Real numbers. Metric spaces. Measure theory on $\mathbf{R}^n$. Basic general topology. Some functional analysis with complex-valued functions. Fourier transform. Multivariate calculus.

- **Probability and Statistics:** Measure theory. Laws of large numbers. Basic concentration bounds. Hypothesis testing. Likelihood-ratio. Data analysis on linear models.

- **Computer Science:** Analysis of randomized data structures. Basic linear optimization. Basic machine learning theory (naive Bayes, gradient descent, regression, clustering, PCA, neural networks and their implementation).

- **Graph Theory:** Graph theory. Algebraic graph theory (graph spectrum, cut and cycle spaces, spanning trees). Probabilistic method (Erdős-Rényi model, thresholds, correlation inequalities). Percolations. Markov chains (mixing times, Doeblin coupling method).

Scholarships and Awards

- Full funding for MMath: $5185 in scholarship + $4315 in TAship per term for 3 terms per year ($28500 per year) for 2 years — Sep 2022 – Jul 2024
- NSERC Undergraduate Student Research Award: summer research grant, $7500 one-time — May 2021 – Aug 2021
- FRQNT Supplement to NSERC: summer research grant, $1500 one-time — May 2021 – Aug 2021
- Bourses Hydro-Quebec Science: merit-based, renewable, $5000 per year for 3 years — 2019 – 2022
- Faculty of Science Scholarship: merit-based, $700 one-time — 2020 – 2021
- Dean's List — 2020 – 2021

Extracurricular Activities

- VP Finance at Society of Undergraduate Mathematics Students — 2020 – 2021
  Preparing the club's budget; coordinating with other members regarding various costs and event expenses; managing the club accounts; submitting monthly audit reports.

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[1] Department of Math and Stats, McGill University
[2] Department of Math and Stats, McGill University