Sebastian Tudor Gherghe

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Personal Summary

PhD in Mathematics with a growing passion for quantitative finance. Detail-oriented and a quick learner with strong analytical and problem-solving abilities. Proven expertise in communication, leadership, and project management, honed through teaching, research, and presentations. Adept at collaborating and translating complex data into clear, actionable reports and presentations. Organized, punctual, and motivated.

Education

PhD in Mathematics 2019 - 2024
Department of Mathematics, University of Toronto. 3.96/4.00. *Toronto, ON*
- Thesis: Adiabatic quantum molecular dynamics, supervisor Prof. Israel Michael Sigal. Topics: many-body quantum mechanics, spectral theory, and PDEs.
- Awarded the Queen Elizabeth II/Israel Halperin Ontario Graduate Scholarship (2023) and the Ida Bulat Teaching Award for Graduate Instructors (2023).

MSc in Mathematics 2018 - 2019
Department of Mathematics, University of Toronto. 3.96/4.00. *Toronto, ON*
- Mathematical analysis of Schrödinger-Poisson systems, supervisor: Prof. Israel Michael Sigal.
- Awarded the Margaret Isobel Elliott Graduate Scholarship (2019).

B.Sc. (Hons) in Mathematics and Physics 2014 - 2018
University of Toronto. 3.49/4.00. *Toronto, ON*
- Awarded the George Roderick Fraser Scholar for Mathematical Studies (2015-2017) and the George Roderick Fraser Undergraduate Admission Scholarship (2014).

Experience

Graduate Researcher 2018 – 2024
Department of Mathematics, University of Toronto *Toronto, ON*
- Proven ability to conduct independent high-level research and effective collaboration in many-body mathematical quantum mechanics, spectral theory, and quantum chemistry, with multiple preprints.

Data Science Bootcamp 2021
The Erdős Institute *Online*
- Learned: Data collection, analysis, and exploration techniques, including supervised learning (classification, regression), unsupervised learning (dimensionality reduction, clustering), neural networks, and basic time series analysis. Link to certificate.
- Collaborated on a final project that involved extracting and analyzing data from approximately 3,000 World Bank loan agreements to perform regional and textual analysis.
- Utilized: Python (pandas, numpy, sklearn, nltk, matplotlib), PCA, Github.

Course Instructor 2023 – 2024
Department of Mathematics, University of Toronto *Toronto, ON*
- Designed syllabi, prepared assignments and exams, managed teaching assistants, and lectured for over 6 courses ranging from first-year calculus to third-year partial differential equations, managing lectures of up to 150 students.

Projects

Olliver-Ricci curvature as a fragility indicator 2024
Department of Mathematics, University of Toronto *Toronto, ON*
- Coauthored a preprint (arxiv link) exploring theoretical and statistical properties of a stock market fragility indicator inspired by optimal transport. Tested on real-world datasets such as the S&P 500, NDXT, and TMX.
- Utilized: Python (pandas, numpy, yfinance), Optimal transport, graph theory, Github.

Technical Skills

Languages: (*Proficient*) Python, LaTeX, Linux, Git. (*Familiar*) SQL, R, Matlab, C/C++, Java, HTML, CSS.