Ishaan Singh Chandok

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Education

B.Sc. at University of Toronto, Canada   **Sep 2019 - Apr 2023**
  Mathematics and Physics Specialist, 3.84 CGPA
St. Robert Catholic High School   **Sep 2015 - Jun 2019**
  Received International Baccalaureate Diploma

Research and Work Experience

University of Toronto Work Study Program   **Sep 2022 - Present**

- Supervised by Prof. Mei Zhen and funded by the Work Study Program
- First project is to use techniques in graph theory to study the differences in connectivity between dauer and non-dauer *C. elegans*
- The second project involves modeling the dynamics food transport in *C. elegans*

Lunenfeld-Tanenbaum Institute's Summer Research Program   **May 2022 - Aug 2022**

- Supervised by Prof. Mei Zhen and funded by the Lunenfeld-Tanenbaum Research Institute
- Developed stitching and alignment algorithms to process high-resolution electron microscopy (EM) datasets
- Had the opportunity to visit the Samuel Lab and the Lichtman Lab at Harvard University to study the techniques they use to process and analyze EM data

Teaching Assistant: MAT135H   **Sep 2022 - Present**

- Responsibilities include running tutorials, invigilating exams and marking assignments

PHY479Y: Research Project Course   **Sep 2021 - Aug 2022**

- A year-long research project course supervised by Prof. John Wei
- The focus of the project was to search for high-temperature superconductors in the infinite-layer nickelates in both bulk powder and thin-film form
- Experimental techniques used include solid state synthesis, x-ray diffraction and pulsed laser deposition
- Mentored two undergraduate students during Summer 2022, helping them with their experiments

Internship at Philips Canada   **July 2018 - August 2018**

- Responsibilities included data entry in Excel, filing of customs paperwork, and customer service

Co-Curricular Activities

University of Toronto Math Union: Treasurer   **May 2022 - Present**
- Responsibilities include organizing events and keeping track of the club's finances

University of Toronto Seismic Design Team   **Sep 2019 - Present**
- The team's goal is to design and construct a 5 foot Balsa wood tower, which is then tested under seismic loads at an international competition
- Wrote optimization algorithms in python to assist with the design of the competition tower
- Use finite element analysis and design software such as HyperWorks and SAP2000 to simulate the effects of seismic loading on the tower

Honours and Awards

- C.L Burton Open Scholarship (Oct 2021, 2022)
- Dean's List Scholar (Jun 2021, 2022)
- George Roderick Fraser Scholarship for Mathematical Studies (Oct 2019, 2021, 2022)

Academic Projects

MAT1510H Final Project: The Effect of Padding Methods on the Accuracy of a Segmentation Network
- Studies how well flood filling neural networks perform neuron segmentation, particularly on the boundary of an image, and the effect padding methods have on the accuracy of the network

PHY479Y Final Project: Synthesis of Infinite-Layer Nickelates in Thin Film and Bulk Form
- Wrote a 30 page report detailing the background and results of the project
- Delivered a 20 minute presentation, followed by 25 minutes of questions

MAT367H Bonus Essay: Studying Fundamental Principles in Knot Theory
- Discusses the motivation of definitions in knot theory from the perspective of differential geometry

MAT327H Final Essay: Applications of Knot Theory to Fluid Dynamics
- Studies helicity, an invariant of the Euler equations, and its relation to knot theory

Relevant Skills

Proficient in Python
Fluent in English and Punjabi