Hanchen (Howard) Xiao

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SUMMARY

Incoming fourth year Computer Science Specialist and Mathematics Specialist undergraduate student at University of Toronto. I am interested in connecting mathematical interest of Lie theory with computer science interest of computational imaging and computer vision in general, to understand various geometric structures.

EDUCATION

University of Toronto, Bachelor's Degree – Toronto, ON
Computer Science Specialist and Math Specialist, Expected in June 2025 GPA: 3.86

- **Computer Science Knowledge:** Computer Vision, Artificial Intelligence, Machine Learning, Natural Language Processing, programming languages, data structures, algorithm design, software design principles, software development life cycle concepts, and computer hardware.
- **Strong Math Background:** differential geometry, linear algebra, multivariate calculus, real and complex analysis, abstract algebra, and graph theory.

Stanford University, Summer Session – Stanford, CA Computer Science And AI, Graduated August 2022 GPA: 4.00

- Acquired knowledge in latest technologies of: VR Systems, Symbolic Systems, and language models.

RESEARCH EXPERIENCE

Dynamic Graphics Project at University of Toronto, September 2023 – Now Toronto, ON

- Currently ongoing research related to Ultra-wideband single photon imaging and 3D reconstructions.

Research on Maximal Tori in Apposition with Prof. Eckhard Meinrenken, May 2024 – Now Toronto, ON

- Exploring maximal tori in apposition to standard torus of classical finite dimensional lie groups.

Research on Infinite Dimensional Lie Groupoid with Prof. Boris Khesin, September 2023 – Now Toronto, ON

- Exploring central extensions of the Virasoro groupoid and algebroid.

Research on Rate of Convergence of Steiner Symmetrization with Prof. Almut Burchard, August 2023 – April 2024 Toronto, ON

- Explored types of surfaces whose properties are preserved under Steiner Symmetrization.
- Utilized various properties of Steiner Symmetrization and explored the relation between them and the rate of convergence.

Reading Course on Lie Groups and Lie Algebra supervised by Prof. Eckhard Meinrenken, April 2023 - August 2023 Toronto, ON

- Detailed discussion involving lie groups, lie algebras, elementary lie groups and their topologies.
- In-depth analysis of actions of lie groups and lie algebras, universal covering groups and classification of compact lie groups.

WORK EXPERIENCE

Teaching Assistant, January 2024 – April 2024 Toronto, ON

- Responsible for marking, exam questions review and invigilation for MAT247H1: Linear Algebra II course at University of Toronto, St. George campus.

Software Developer Intern, Bell Mobility – Bell Canada, May 2023 – May 2024 Toronto, ON

- Utilized Python, Ruby and SQL and machine learning techniques to develop an interactive testing case database to log network testing for network features in collaboration with Ericsson and Nokia teams.
- Utilized Llama-2 model and Langchain framework to fine-tune open-sourced large language model into internal document retrieval and code generator tool. Initiated various projects related to Generative AI use in daily work tasks.

Data Analyst Intern, JD - JD Technology, June 2021-August 2021 Beijing, China

- Utilized SQL, Excel, visualization tool AgileBI to complete 2021 Q2 member persona for 400 million JD APP active users.
- Worked in a team of 3 to analyze and solve high level inactive user recall problem. Developed and executed strategies through applying machine learning techniques and telephone interview for customers, recalled many of them.
- Managed conflicting task priorities and worked both independently and collaboratively with various departments for project development, data support and project management.