

# GEORGE SAAD

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## Education

### University of Toronto

MASc, Research in Conversational Recommender Systems supervised by Prof. Scott Sanner

Sep. 2023 – Present

GPA: 4.0 (out of 4.0)

### University of Toronto

BASc in Engineering Science, Major in Machine Intelligence, Certificate in Engineering Business

Sep. 2019 – May 2023

GPA: 3.76 (out of 4.0)

## Experience

### University of Toronto

Research Assistant

Toronto, ON

May 2023 – Present

- Working on integrating information retrieval and **LLMs** (such as **GPT-4**) with conversational recommender systems to improve the state-of-the-art in recommendation at Scott Sanner's Data Driven Decision Making (D3M) Lab

Teaching Assistant

Sep. 2021 – Present

- Teaching Assistant for: Introduction to Programming (ESC180) in Python, Algorithms & Data Structures (ESC190) in C, Data Science (MIE223), and Computer Fundamentals (APS105) in C

### Amazon

Applied Scientist Intern

Seattle, WA

Jun. 2024 – Sep. 2024

- Developed a model to improve product search ranking by 29%, impacting over 8.5 million weekly queries on Amazon
- Implemented & tested production-ready code to allow the engineering team to integrate with Amazon's search engine
- Performed extensive prototyping, literature review, and evaluation to present to 50+ team members, including scientists

### Vector Institute

Applied Machine Learning Intern

Toronto, ON

Jan. 2023 – Sep. 2023

- Implemented metrics to evaluate the performance of causal inference estimators, including **TARNet** and **Dragonnet**, on synthetic datasets and observational data with no ground truth counterfactuals
- Led lectures & hands-on sessions on causal estimation & recommender systems for 200+ technical participants, including data scientists and executives from 40+ teams across major sponsors such as RBC, Deloitte, Shopify & Air Canada

### Meta (Facebook)

Software Engineer Intern

Menlo Park, CA

May 2022 – Jul. 2022

- Designed **Thrift** service to add tracking to over 260 million external Instagram story and profile links per day
- Implemented client-side app detection feature which resulted in a 120% increase in ad impressions for Instagram users without linked Facebook accounts, resulting in a roll out to 100% of Instagram users
- Refactored key Instagram Ads endpoints in **Hack (PHP)** and **Python Django** to reduce runtime & memory overhead

### Content Turbine

Software Development Freelancer

Mississauga, ON

Dec. 2020 – Sep. 2021

- Built NoSQL datastore and caching modules for the Akka Play! and Vert.x frameworks in **Java** using **Singleton** and **Dependency Injection (DI)** design patterns, and reactive programming, with Guice and JUnit unit testing
- Wrote ASCIIDOC documentation, created demo apps and wrote technical blog posts

### Loblaw Digital

Software Development Co-op

Toronto, ON

May 2021 – Aug. 2021

- Researched & presented content targeting engine to the 40+ member PC Optimum team, increasing personalization
- Implemented tracking metrics in **Spring Boot Java** and **GCP** with 200k+ data points collected per hour
- Created multiple endpoints to reduce development and testing time by 60% for various parts of the PC Optimum product

## Publications / Research

**Multi-Aspect Reviewed-Item Retrieval via LLM Query Decomposition and Aspect Fusion** | Paper

A. Korikov\*, **G. Saad\***, E. Baron, M. Khan, M. Shah, S. Sanner - *IR-RAG @ SIGIR24*

**Elaborative Subtopic Query Reformulation for Broad and Indirect Queries in Travel Dest. Rec.** | Paper

Q. Wen\*, Y. Liu\*, J. Zhang\*, **G. Saad**, A. Korikov, Y. Sambale, S. Sanner - *ROEGEN @ RecSys 2024*

**Pre-training to Speed Up Reinforcement Learning Thesis** | Paper

Sep. 2022 - Apr. 2023

- Researching methods to improve on the sample efficiency of reinforcement learning when using the A2C framework

\* indicates equal contributions.

## Technical Skills

**Languages:** Python, Java, JavaScript, C/C++, PHP/Hack, HTML/CSS, YAML, PostgreSQL, MATLAB

**Technologies:** PyTorch, JAX, Numpy, Pandas, Scikit Learn, Matplotlib, Spring Boot, React, Node, Flask, Django