

Timothy Gu

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GRADUATE EDUCATION

M.ASC IN COMPUTER ENGINEERING | UNIVERSITY OF TORONTO ST. GEORGE

Sep 2022-current (expected graduation Aug 2024) | GPA: 4.0/4.0

- Optimizing LLM fine-tuning over WAN with ML-driven High-speed inter-cloud data transportation layer. **Rust, Python, TypeScript**
- Accelerated LLaMA2-13b with Q-LoRA fine-tuning speed over 5 data centers by 8x, reducing time from 5 hours to 37 minutes. **HuggingFace Accelerate, DeepSpeed, NCCL, Docker**

EXPERIENCE

MACHINE LEARNING ENGINEER | HUAWEI INTERN/PART-TIME CONTRACTOR

Sep 2021 - Aug 2022 | Toronto, ON

- Built and trained a custom 30-billion-parameter GNN + Transformer model for data-driven optimization, achieving 95% of the theoretical optimum. **PyTorch, PyTorch Geometrics**
- Developed distributed training pipelines and deployed to 8x NVIDIA V100 GPU cluster, improving training speed by over 10x. **Pytorch Distributed, DeepSpeed**
- Integrated the ML model into a traffic engineering system to improve speed by 100-10000x, reducing SDN control cycle time by up to an estimated 90%. **Python**
- Actively led and organized a 4-person research team, hosted daily meetings, and presented research progress weekly in team-wide meetings. **Leadership, Communication**

SOFTWARE ENGINEER | AMAZON WEB SERVICES INTERN

Sep 2020 - Dec 2020 | Vancouver, BC

- Designed and implemented core business metric pipelines as part of AWS Cloud Formation, driving multi-billion dollar business decisions. **Kotlin, Java, AWS EC2, AWS DynamoDB, AWS Athena**
- Managed and deployed software feature to 21 AWS regions and created key maintenance pipelines. **Ruby**
- Hosted and led design meetings with the AWS Cloud Formation team for software architecture design and integration strategies. **Leadership, Communication**

DATA ENGINEER | WAYFAIR INTERN

Jan 2020 - Mar 2020 | Boston, MA

- Built internal automatic big-data model verification pipelines, accelerating data verification process by up to 400x, saving an estimated 8 hours of manual labor per week. **Python, MySQL**
- Managed internal data delivery pipelines between multiple data storage solutions for over 2 billion sales and product records. **MySQL, PostgreSQL, VerticaSQL, Microsoft Access, GCP**
- Developed and maintained complex data schema with over 200 relations.

DATA ANALYST | ENVIRONMENT AND CLIMATE CHANGE CANADA INTERN

May 2018 - Aug 2018 | Ottawa, ON

- Processed and analyzed 17 years of air quality data with over 20,000 records. **R, Matlab.**
- Presented key findings in the August 2018 Departmental conference, highlighted critical insights for over 5 experimental procedures. **Communication**

PROJECT

DEEP PEN | CAPSTONE PROJECT @ UWATERLOO

- Full web application for automated ML adversarial algorithm benchmarking. **Python, Node.js, HTML, CSS, Ruby on Rails, MongoDB, Redis, PostgreSQL, docker.**

SKILLS

SOFTWARE DEVELOPMENT

Python • Rust • TypeScript • Java

DATA

Spark • PostgreSQL • MySQL • MongoDB • Redis • DynamoDB • Pandas

FULL STACK DEVELOPMENT

Next.js • React • TypeScript • HTML5/CSS • Ruby on Rails • AWS • Docker

MACHINE LEARNING

LLM • GNN • Transformers • PyTorch • HuggingFace • Scikit-Learn • Horovod • DeepSpeed • NCCL • CUDA

SOFT SKILLS

Leadership • Presentation • Professional Communication • Academic Writing • Attention to Detail

OTHER

EDUCATION

B.ASC IN HONOURS COMPUTER ENGINEERING

UNIVERSITY OF WATERLOO

Sep 2016-Apr 2022
CGPA: 84/100

AWARDS

Awarded for the University of Toronto Edward S. Rogers Sr. Graduate Scholarships in 2022.

Winner@2019 Hack the North

Winner@2019 EngHack