winnie xu

winnie.xu97@gmail.com | winniexu.ca | xwinxu | +16479391869

SKILLS

LANGUAGES | Python, Golang, Java, C/C++, Bash, R, JavaScript

ML & CLOUD | Tensoflow + TPU, JAX, NumPy, PyTorch, Google Cloud Computing, Conda, Slurm

FULL STACK | React.js, Django, HTML/Bootstrap, SQL, iOS, Git, MongoDB, Android, Unix/Linux

CREATIVE | CAD, Adobe Suite, Microsoft Office

AWARDS

NSERC Undergraduate Student Research Award (declined) | 2020

1st Place + Axelrad Award for Best Computer Science Research | 2018

Princess Margaret Research Studentship for top undergraduate research | 2018

Silver Medal + Top 20 @ Canada Wide Science Fair | 2017

1st Place Honours @ Sanofi Biogenius Challenge | 2017

Top 15% National Mathematics Contest @UWaterloo | 2017

EDUCATION

UNIVERSITY OF TORONTO

COMPUTER SCIENCE && STATISTICS && MATH — 2022 — **ComSci GPA: 3.7/4.0**

CS | Machine Learning (graduate), Probability (adv.), Linear Algebra, Algos & D.S, Calculus, Software Design, Computational Theory

Life Science (2017-19) | Evolution, Biology, Chem, Genetics, Neurosci

EXPERIENCE

Google Brain | Research Engineering Intern — Summer 2020

TENSORFLOW AT GOOGLE AI

- Actualizing state of the art research in **sparse neural network** training on hardware platforms
- Researching extensions to **Lottery Ticket Hypothesis** towards better network **pruning** methods

Vector Institute | Deep Learning Research Intern — Winter 2020 - Present

ADVISORS: DAVID DUVENAUD (VECTOR INSTITUTE)

- Using **neural stochastic** differential equations for infinite-depth **Bayesian neural nets** & continuous time data. Application to model-based **reinforcement learning** & **generative models**
- Developing custom research **frameworks** and **environments** in **Tensorflow, Pytorch, & JAX**

Google | Software Engineering Intern — Summer 2019

GOOGLE CLOUD BUILD INFRASTRUCTURE

- Designed, tested, and released **4 new binaries + Skylark container rules** on **Google Cloud Registry,** providing **backwards compatibility** to the **rules-docker open source** repository
- Migrated **Python backend** to **Go** & incorporated **Bazel** to build **hermetic Docker containers**
- Implemented specifications for **legacy** & new **V2.2/multi-OS** Docker Image Schemas

aUToronto | Software Engineer (Perception) — Summer 2019-Present

U OF T AUTONOMOUS VEHICLE DESIGN TEAM

- Designing **level-4 autonomous computer vision** systems for **pedestrian/vehicle detection**
- Adapted **state-of-the-art research** techniques including **SqueezeDet & PointPillars**
- Worked **collaboratively** to deploy software for **SAE Autodrive Challenge** (**1st place** in '18 & '19)

RESEARCH

FOR.ai | Machine Learning Researcher — Summer 2019 - Present

ADVISOR: AIDAN GOMEZ

- Improving **neural network training** and **data efficiency** with novel **progressive growth** networks built in **Keras & Tensorflow 2.0** with **TPU** deep learning acceleration + **Tensorboard** integration
- Exploring **Targeted Dropout** in obtaining sparse and performant neural networks
- Build & maintain custom **deep learning codebase** for modular + extensible experimentation

Princess Margaret ML Cancer Research | Research Intern — Summer 2018

ADVISOR: MICHAEL HOFFMAN

- Developed **epigenetic annotation pipelines** & adapted **unsupervised ML** (**Segway** + **sci-kit Learn**) techniques to **quantify and predict** key cancer-linked proteins from **20+** high-res next generation sequencing datasets, validating **2 new ChIP-seq** technologies
- Visualized generated **insights on data resolution utility** with **R, Seaborn (Python), & Bash**

PROJECTS

DOC: Digital On-Call-Healthcare Consultant — BCGxGoogle GE Week 2019

- Built a **javascript** powered front-end interfaced with **mixed-Gaussian** statistical model in **Python** that mapped health data to symptom diagnosis via real time **NLP** of speech transcript
- Won **1st Place Award** out of select top 40 teams across all Canadian universities

Innovape: The Health Aware Vape — Top Prize - Hack the North 2019

- Reverse-engineered a **Juul,** remodelled architecture w/ **Arduino**, and added a personalized nicotine reduction algorithm via **Gaussian modelling** to dynamically reduce nicotine output

SocialBIT — HackMIT 2018

- Real-time '**social Fitbit**' that tracks social interactions at the micro-scale and generates visualizations for social frequency with location tracking using **D3.js** & **Firebase**
- Implemented **facial recognition algorithm** with **OpenCV/dlib** + **YOLOv3** that detects select acquaintances in live video from a glasses-mounted **Raspberry Pi** camera