winnie xu

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SKILLS

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

ML & CLOUD | Tensoflow + TPU, PyTorch, scikit-learn, MS Azure, Google Cloud Computing, Conda, HPCC cluster OS (Slurm)

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

CREATIVE | CAD, Adobe Suite, Microsoft Office

AWARDS

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 (MINOR) — 2021 — **ComSci GPA: 3.90/4.0**

CS Core | Machine Learning, Probability, Linear Algebra, Algs + Data Structures, Software Design, OOP, Computational Theory

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

EXPERIENCE

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

ADVISORS: DAVID DUVENAUD (VECTOR INSTITUTE) + SHANE GU (GOOGLE BRAIN)

- Using neural **stochastic** differential equations for **Bayesian neural nets** and continuous time-series data. Applications 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
- **10% Project (Google Serve):** Kitchener-Waterloo Art Gallery touchscreen display software

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)

HiRide Inc. | Full Stack Developer — Winter 2019

NLP + CHATBOT

- **Student carpooling app** built with **React.js** that replaces ride share events on social media
- Used **Dialogflow** to build interactive **chat bot** to **save 90%** of manual rider-driver coordination

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 **curriculum learning algorithms** for self-driving in CARLA simulation environment
- 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 then visualizes the frequency of encounters 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