# Jacob Kelly

jacobjinkelly.github.io · jacob.kelly@mail.utoronto.ca · github.com/jacobjinkelly

## Education

**University of Toronto** — Toronto, ON
AI Specialist · Computer Science, Math, Stats · *cGPA:3.91/4 (89%)* — Sep 2017 — Jun 2021
Coursework: Machine Learning (Graduate-Level) · Algorithms & Data Structures (Advanced) · C & Systems Programming · Vector Calculus on Manifolds · Mathematical Probability

## Experience

**Machine Learning Researcher** · Python · JAX — Toronto, ON
Vector Institute for AI · Supervisor: David Duvenaud — Sep 2019 — Present

- Improving efficiency of Neural Ordinary Differential Equations (Neural ODEs).

**Autonomy Engineer** · Python — Toronto, ON
aUToronto Self-Driving Car Team — Sep 2019 — Present

- Adapting state-of-the-art deep learning research (SqueezeDet, YOLO) to detect traffic lights and road signs for Level 3 autonomous navigation as part of SAE Autodrive Challenge.

**Computational Biology Researcher** · R · Bash · MATLAB — Toronto, ON
Princess Margaret Cancer Research · Supervisor: Benjamin Haibe-Kains — Apr 2019 — Sep 2019

- Developed R package for benchmarking machine learning methods for inferring sample-specific gene regulatory networks from single-cell RNA sequencing (scRNA-Seq) data.
- Trained elastic net regularized regression with pathway-based feature selection to infer drug response of cell lines from gene expression for patients with acute myeloid leukemia (AML).

**Computer Vision Software Developer** · SPEL+ (internal C++ wrapper) — Markham, ON
Epson Research and Development Lab — May 2018 — Aug 2018

- Optimized motored stage movements and performed image capture and evaluation asynchronously, supporting researchers by improving speed of data collection by 58%.
- Designed and implemented anchor point based motor-camera calibration method for comparison of 2D object detection and pose estimation algorithm performance on a wide-range of objects.

**Android Developer** · Java · Android SDK · Estimote API — Toronto, ON
Cossette Health Lab — Jul 2016 — Aug 2016

- Led two team members in reducing noise in bluetooth beacon signal to improve localization and pathfinding algorithms for indoor navigation system for SickKids Hospital.

## Projects

**Machine Learning for Health** · PostgreSQL · Python · pandas · scikit-learn · Keras · NLTK · gensim

- Queried Postgres database and summarized data from over 50,000 admissions of nearly 40,000 patients to Beth Israel Deaconess Medical Center.
- Predicted mortality and hypertension from clinical notes and vital signs data using logistic regression and recurrent neural network (RNN) machine learning models.

**Genomic Sequencing** · C++ · Make · Bash — github.com/jacobjinkelly/sequencing

- Implemented Boyer-Moore for genomic sequence alignment with linear time construction of indexes using Z algorithm, achieving 3.5x speedup over naive algorithm.

## Awards

**Undergraduate Student Research Award, NSERC Canada** (declined) — 2019
**Certificate of Distinction (Top 15%), National Mathematics Contest, UWaterloo** — 2017
**1st Place, ECOO Programming Contest** — 2017

## Skills

**Languages & Frameworks:** Python · C/C++ · R · Java · PyTorch · JAX · TensorFlow · NumPy

## Interests

**Extracurricular** — CS First-Year Learning Community Mentor
**Miscellaneous** — 3Blue1Brown · Nerdwriter · Ted Chiang · Westworld · Rock Climbing · Running