Jacob Kelly

jacobjinkelly.github.io · jkelly@cs.toronto.edu · github.com/jacobjinkelly

Education

University of Toronto — Toronto, ON
Computer Science, Math, Stats · *cGPA:3.93/4 (90%)* — Sep 2017 — Jun 2022
Coursework: Machine Learning (Graduate-Level) · Advanced Algorithms & Data Structures · Advanced Differential Equations · Stochastic Processes · Molecular Biology

Experience

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

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

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 — 2020
Dorothy Helen McRobb Scholarship — 2019
David L. Squires Foundation Scholarship — 2019
Margaret Ronald & Thomas Paxton Taylor Scholarship in Mathematics — 2019
Distinction (Top 15%), Euclid National Mathematics Contest, UWaterloo — 2017
1st Place, ECOO Central Ontario Programming Contest — 2017

Skills

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

Interests

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