Brenden Kadota

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RESEARCH EXPERIENCE

Research Assistant

- Dr. Jamie Near, Douglas Mental Health University Institute — Apr 2019 – Apr 2020
  - Independently developed novel MATLAB package to process raw, multidimensional Magnetic Resonance Spectroscopic Imaging (MRSI) data. Other packages exist but cost up to $10,000, this is free and open-source.
  - Created a MRSI simulation package that is able to determine benefits and visualize any MRSI pulse sequence.
  - Created 3 pulse sequence simulations that are modifiable by input parameters.
  - Developed 2 data visualization functions, one to display the MRSI image and the other to overlay the MRSI onto an MRI.
  - Held weekly 1 hour meetings with my professor to collaborate on future innovations.
  - Drafted written documentation for all 18 functions and 2 reports of my progression.

Honours Project

- Dr. Jerome Waldispuhl, McGill University — Sep 2019 – Apr 2020
  - Created hint system for a game designed to align multiple sequences of RNA or DNA.
  - Developed 4 tools to aid players in achieving better alignments.
  - Merged my branch with master using GitLab and uploaded to the web.
  - Independently game breaking bug and fixed it.

Research Intern

- Institute for Research in Immunology and Cancer (IRIC), Université de Montréal — Jun 2018 – Aug 2018
  - Developed python algorithm to detect gene fusion mutations in cancer patient's RNA-Sequencing data.
  - Utilized cluster computing and TORQUE resource manager to test algorithm on 13 known mutations found on genomics data commons portal.
  - Tested algorithm on 1109 breast cancer samples from the cancer genome atlas cohort.
  - Worked in a UNIX environment to run algorithm and manipulate RNA-Sequencing data.
  - Presented poster of my work which received best presentation over 18 other interns.
  - Validated correct algorithm mutation detection with the UCSC genome browser and SAMtools.

Research Assistant

- Dr. Allen Ehrlicher, McGill University — Jan 2018 – Apr 2018
  - Created genetic circuits in E.Coli. Circuits functioned through gene inhibition and activation acting as logic gates.
  - Gave bimonthly presentations to peers and supervisor on my progress.
  - Familiarized myself with molecular biology techniques and experiments.

VOLUNTEER EXPERIENCE

VP External and VP Finance

- McGill Ultimate Team, McGill University — Jun 2018 – Jun 2020
  - Recorded and managed four teams funds and submitted audit at the end of each semester.
  - Obtained over $300 worth of sponsorships from outside companies.

External Committee

- Manaba McGill, Manaba McGill — Jun 2018 – Jun 2020
  - Managed ticket sales for an events with over 100 participants.
  - Coordinated between other members to find sponsorships for members.

EDUCATION

Bachelors of Science, Honours Computer Science and Biology

- McGill University,Montréal, Québec, Canada — Sep 2016 – Apr 2020

- Cumulative GPA: 3.8/4.0, Graduated with First Class Honours.

KEY PROJECTS **All projects can be found on GitHub**

- Developed a gene browser using the MEAN stack (Mongodb, express, angular, and node.js) to present NCBI's RefSeq and RefSeqGene data.
- Learned and created logistic regression, naive Bayes, and neural network machine learning models from scratch. All created in python.
- Created an algorithm to align query sequences to a probabilistic genome using the Burrows–Wheeler transform and seed sequences similar to BLAST.
- Used hidden markov model to detect open reading frames in bacteria DNA.