

# Alex Sweeten | Résumé

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## Education

- **M.Sc, Computing Science** **Simon Fraser University**  
*Graduate Supervisor: Leonid Chindelevitch* *2017–2019*  
Thesis Title: Accurate Alignment-Free Inference of Microbial Phylogenies
- **B.Sc, Molecular Biology & Biochemistry** **Simon Fraser University**  
*Joint major in Computing Science, Molecular Biology & Biochemistry* *2012–2017*

## Professional Experience

- **Research Assistant** **Simon Fraser University**  
*Computational Epidemiology Lab* *September 2017 - Present*
  - Implemented bacterial genotyping tools such as Single Nucleotide Polymorphism (SNP) and Copy Number Variant (CNV) detecting software into the 'PathOGiST' project.
  - Collaborated in an agile software developer environment, using SCRUM for peer-review.
  - Presented original research in group meetings and at various computational biology conferences.
- **Teaching Assistant** **Simon Fraser University**  
*CMPT 353 & 705 (Data Science, Design & Analysis of Algorithms)* *September 2017 - Present*
  - Graded student's assignments, held office hours, invigilated exams, provided technical feedback on submitted code, and gave lectures when the professor was absent.
  - Taught topics on graph theory, machine learning, quantum computing, and complexity theory.
- **Informatician** **The Centre for Drug Research and Development**  
*SFU Co-op* *May - September 2017*
  - Developed a "mechanistic" drug screening library for CDRD's Medicinal Chemistry department.
  - Utilized data mining tools to extract meaningful information from online protein and drug databases.
- **IT Coordinator** **Mission Community Services Society**  
*SFU Co-op* *June - August 2016*
  - Developed an inventory and scheduling management program to coordinate "Meals on Wheels" deliveries throughout the district of Mission.
  - Trained staff and volunteers how to use software appropriately and how to install hardware.
- **Bioinformatics Assistant** **Kinexus Bioinformatics**  
*SFU Co-op* *May - September 2015*
  - Performed sequence analysis for oncoproteins and tumor-suppressor protein kinases involved in phosphorylation pathways related to cancer.
  - Provided maintenance, coding, and updating for various websites, such as PhosphoNET and KinaseNET, for the Kinexus open-source SigNET database.

## Selected Projects

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- **SNACC: Sequence Non-Alignment Compression & Comparison**  
<https://github.com/SweetiePi/snacc>
  - Developed a novel alignment-free method for reconstructing bacterial phylogenies using the Normalized Compression Distance, used as the major contribution towards my Master's thesis.
  - Presented SNACC at the University of Wisconsin-Madison, upon submission to the 2019 Great Lakes Bioinformatics conference (GLBIO 2019).
- **PathOGiST: Calibrated Multi-Criterion Genomic Analysis for Public Health Microbiology**  
<https://github.com/WGS-TB/PathOGiST>
  - PathOGiST is a clustering tool using a combination of genotyping signals such as SNP's, MLST's, and CNV's to cluster bacterial pathogens into epidemiologically related groups.
  - Integrated many of these genotyping methods and tested them on datasets of *Mycobacterium tuberculosis* and *Listeria monocytogenes* samples.

## Skills

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- **Programming Languages:** Proficient in Python, R, SQL, Bash. Familiar with C++ and Java.
- **Bioinformatics Software:** Proficient in QIIME2, Galaxy, Bioconductor, BioPython.
- **Big Data & Machine Learning:** Proficient in NumPy, Pandas, Scikit-Learn, Tensorflow. Familiar with Spark and Amazon Redshift.

## Honors & Awards

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- **NSERC: Create Scholarship**  
Amount: \$22,000 CAD September 2018
- **Pacific Leaders Scholarship**  
Amount: \$2,500 CAD July 2017
- **James R. Hoffa Scholarship**  
Amount: \$1,000 USD September 2016

## Volunteer & Extracurricular Experience

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- **Hackathon Organizer** **Vancouver, BC**  
*hackseq* *April 2018 - Present*
  - Key organizer for "hackseq", an annual genomics hackathon located in Vancouver.
  - Organize team leaders, reach out to sponsors, and manage the organization's social media presence.
- **Climbing Wall Attendant** **Burnaby, BC**  
*SFU Climbing Wall* *September 2017 - Present*
  - Perform belay checks, set new climbing routes, organize social events, and help orient first time rock climbers for Simon Fraser University's climbing wall.
  - Standard First Aid with CPR-C certified.