# Lin (Bill) Qi | Curriculum Vitae

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## Education

**PhD Candidate in Human Genetics** **Montreal**
*McGill University* *2020 - Ongoing*

**AI in Healthcare Nanodegree** **Online**
*Udacity (https://graduation.udacity.com/confirm/WUYDCYDH)* *2022 - 2023*

**Major in Microbiology & Immunology** **Montreal**
*McGill University* *2013 - 2017*

## Experience

**Department of Human Genetics** **McGill, Montreal**
*PhD Candidate* *September 2020 - Ongoing*
- Development of graph neural network model architectures for genome data analysis of 500k individual genomes from the United Kingdom Biobank.
- Clustering analyses of genomic (whole exome data), transcriptomic (Gene expression array and RNAseq), and metabolomic (NMR) datasets of patients with neuropsychiatric diseases (Depression, Schizophrenia, Autism)
- Developing machine learning based detection and classification algorithms based on genomic, and functional genomic data for understanding psychiatric disorders.
- Utilizing data from bioinformatic databases such as NCBI, KEGG, Gene Ontology, Enrichr, Genemania, Reactome, miRBase, etc.
- Symptom-based statistical analysis of major depressive patients.
- Nanopore ligation and rapid-kit long-read sequencing and bioinformatic analysis.
- 10X Genomics single-cell sequencing and analysis.
- Illumina short-read sequencing and analysis.
- Performing LD score regression and genetic correlation analysis.
- Genetic fine-mapping for causal variants detection.
- Polygenic risk-score methods incorporating linkage disequilibrium.
- Topic modelling of electronic health record data.
- Variational inference neural network approach for genomic data analysis.

**Ericsson** **Montreal**
*Software Developer* *July 2017 - September 2018*
- Developed natural language processing model to suggest the most appropriate engineers out of 6000 to troubleshoot a ticket, with a 70% prediction accuracy.
- Developed a personalized search component of the customer support tool to help engineers find the most relevant technical knowledge.
- Developed a machine learning model to suggest appropriate solutions for new tickets using 500000 previously solved tickets.
- Built a question-answering chatbot using IR and deep learning techniques to extract out concise answers from a knowledge base containing millions of documents.
- Develop and maintained front-end and back-end services for a customer support tool used by engineers and customers.
- Developed and maintained an internal information dashboard tool.
- Developer support for project maintenance (troubleshoot bugs and issues).

**Behavior Health Research Group** **Jewish General Hospital, Montreal**
*Volunteer Research Assistant* *Jan 2015 - Sep 2019*
- Maintaining the BHRG team's website, updating team members' biography and managing site content.
- Contributing to literature reviews using DistillerSR.
- Wrote a program for automated searching and downloading of research articles by title or Pubmed ID.
- Proofreading draft manuscripts and managing citations for team members.

**McGill University Health Centre** **McGill, Montreal**
*Volunteer Research Assistant* *Jan 2015 - Sep 2018*
- Extracting patient details from hundreds of clinical case studies.
- Using python to process and transform large quantities of patient genetic data for analysis.
- Wrote a program for automated extraction of information from PDF forms and generate letters

## Publications

- Rice, Danielle B., Lorie A. Kloda, Brooke Levis, **Bill Qi**, Emily Kingsland, and Brett D. Thombs. "Are MEDLINE searches sufficient for systematic reviews and meta-analyses of the diagnostic accuracy of depression screening tools? A review of meta-analyses." *Journal of psychosomatic research 87* (2016): 7-13.

- Azar, Marleine, Kira E. Riehm, Nazanin Saadat, Tatiana Sanchez, Matthew Chiovitti, **Lin Qi**, Danielle B. Rice et al. "Evaluation of Journal Registration Policies and Prospective Registration of Randomized Clinical Trials of Nonregulated Health Care Interventions." *JAMA internal medicine* (2019).

- Sardaar, Sameer, **Bill Qi**, Alexandre Dionne-Laporte, Guy A. Rouleau, Reihaneh Rabbany, and Yannis J. Trakadis. "Machine learning analysis of exome trios to contrast the genomic architecture of autism and schizophrenia." *BMC psychiatry* 20, no. 1 (2020): 1-11.

- **Qi, Bill**, Laura M. Fiori, Gustavo Turecki, and Yannis J. Trakadis. "Machine learning analysis of blood microRNA data in major depression: a case-control study for biomarker discovery." *International Journal of Neuropsychopharmacology* (2020).

- MacDonald, Kellie, Yuting Jiang, Ankur Krishnan, Sameer Sardaar, **Bill Qi**, Aristotelis Eleftheriadis, Stephen J. Glatt et al. "Patient stratification using metabolomics to address the heterogeneity of psychosis." *Schizophrenia Bulletin Open* (2020).

- **Qi, Bill**, Kellie MacDonald, Marcelo T. Berlim, Allan Fielding, Eric Lis, Nancy Low, Stéphane Richard-Devantoy et al. "Balance problems, paralysis, and angina as clinical markers for severity in major depression." *Frontiers in Psychiatry* (2020).

- **Qi, Bill**, Janani Ramamurthy, Imane Bennani, and Yannis J. Trakadis. "Machine learning and bioinformatic analysis of brain and blood mRNA profiles in major depressive disorder: A case-control study." *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics* (2021).

- Trakadis Y, Accogli A, **Qi B**, Bloom D, Joober R, Levy E, Tabbane K. "Next-generation gene panel testing in adolescents and adults in a medical neuropsychiatric genetics clinic." *Neurogenetics* (2021).

## Projects

- **Chatting with media files using GPT:** *https://chatmedia.io/*
- **Topic modeling EHR data:** *https://github.com/bill-95/LDA-Gibbs-sampling-for-EHR-data*
- **Baysian fine-mapping of genomic data:** *https://github.com/bill-95/Bayesian-Fine-Mapping*
- **Intent-based chatbot:** Developed a chatbot to help users navigate the Connected Urban Transport tool for Ericsson's IoT team hackathon event, achieving a validation accuracy of 84%. *https://github.com/LamUong/IOT-chatbot*
- **Codepen frontend projects:** *https://codepen.io/bill_95*
- **Kaggle machine learning competitions (*https://www.kaggle.com/billqi*):**
  - Contribution to the "COVID-19 Open Research Dataset Challenge"
  - Top 2% (48/2893 teams) in "Ubiquant Market Prediction"
  - Top 4% (60/1687 teams) in "RSNA Screening Mammography Breast Cancer Detection"
  - Top 9% (73/874 teams) in "Santa 2022 - The Christmas Card Conundrum"
  - Top 11% out of 3314 teams in SIIM-ISIC Melanoma Classification Challenge

## Skills

- Python; R; Javascript; Tensorflow; PyTorch; Scikit-Learn; Flask REST API; Angular; PostgreSQL; SQLite; Elasticsearch; SLURM; Genomic sequencing and bioinformatic analysis (Nanopore, Illumina, 10X Genomics single-cell, RNA-seq), Deep learning; Natural language processing; 2D/3D imaging analysis; Time-series data analysis.

## Awards

- **Frederick Banting and Charles Best Canada Graduate Scholarship-Master's (CIHR)** - 2020-2021 - $17500
- **BSIA bursary award (BSIA of BC)** - 2018-2019 - $1000
- **Emily Ross Crawford Scholarship (McGill)** - 2015-2016 - $500
- **Faculty of Science Scholarship (McGill)** - 2014-2015 - $150