Ping Luo, PhD

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Postdoctoral fellow with >9 years of combined science and engineering experience in integrating multimodal datasets to identify biomarkers and targets relevant to cancer diagnosis and drug development, with teaching and writing skills gained through postsecondary teaching and publishing. Seeking to apply my data analytics experience and collaborative skills to facilitate the development of new diagnosis and treatment strategies.

Work Experience

Postdoctoral Researcher, Princess Margaret Cancer Centre, Toronto
11/2019 – Present

- Design pipelines to identify cancer-related signatures by analyzing next-generation sequencing data measured from the blood samples of cancer patients and healthy controls.
- Train machine learning models with the identified signatures to diagnose cancers and achieve high performance (>0.90 sensitivity).
- Apply the pipeline to 6 types of cancers in 4 projects (>650 samples) and demonstrate the feasibility of using liquid biopsy to non-invasively diagnose cancer. Collaborative skills were gained through working with oncologists, pathologists, and pediatricians.
- Review and evaluate 26 (19 supervised and 7 unsupervised) algorithms for predicting cell identities in 8 cancer single cell RNA sequencing datasets.
- Help to implement the most accurate cell type prediction methods to our online single cell analysis platform (https://crescent.cloud/).
- Analyze single cell and single nuclei RNA sequencing data of patients with multiple myeloma (bone marrow cancer) and identify mechanisms related to longer survival.

Education

Ph.D., Biomedical Engineering, University of Saskatchewan
09/2015 – 09/2019
Thesis: Identifying disease-associated genes based on artificial intelligence

- Develop algorithms to predict disease-causing genes by training machine learning models with features extracted from multi-view data, such as protein/disease interaction networks, ontology databases, gene expression, etc.
- Apply models, such as convolutional neural networks, multimodal deep belief net, etc. to enhance the data integration, which improves the accuracy of disease gene prediction.

M.Eng., Biomedical Engineering, Beijing Institute of Technology
09/2013 – 06/2015
Thesis: 3D printed micro stereotactic frame for Deep Brain Stimulation

- Develop a software tool for visualization and registration of MRI and CT images of patients with Parkinson's disease.
- The tool automatically builds STL format file, which could be 3D printed and used in the Deep Brain Stimulation surgery (treat Parkinson's disease).

Skills

- Python, R, C++
- Deep learning with TensorFlow, Keras and PyTorch
- Cell-free methylated DNA immunoprecipitation sequencing
- Whole genome sequencing
- Single cell/nuclei RNA-seq
- Pipeline development with Snakemake
- Data visualization
- Science communication and presentation
- Grant and proposal writing
- Project management

Publication & Presentations

- 15 journal publications including 8 first author papers
- 3 manuscripts under revision and 3 in preparation
- 8 oral presentations, including 4 invited talks

Professional Association

2021 - present
Program Committee Member, IEEE International Conference on Bioinformatics and Biomedicine

Hobbies

Sci-fi, Hiking, Skiing, Gardening