Bingfan Liu

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SUMMARY OF QUALIFICATION

- 4-year experience using R, Python for data analysis.
- 1-year experience using SQL for data query and manipulation in RDBMS.
- Machine learning experience using Keras, PyTorch, Scikit-learn, Numpy, Matplotlib, Pandas and Google Colab.
- Computer vision experience using Scikit-image, ChainerCV, Torchvision, PIL.
- Strong statistics background in statistical modeling, quality control and hypothesis testing.

EXPERIENCE

Machine Learning Researcher in Functional Brain Signal Data Analysis | *University of Waterloo* Sep. 2019 - Aug. 2020
- Constructed a novel functional machine learning model for allocating disease related brain area using fMRI.
- Implemented a fast convex optimization algorithm for high dimensional coefficients and projection directions estimation.
- Conducted extensive independent research including literature reviews, methodology discussions and presentations.

Teaching Assistant in Statistics | *University of Waterloo* Sep. 2019 - Aug. 2020
- Tutored over 700 undergraduate students' probability and statistics theories and graded their homework and exams.
- Assisted over 200 students' hypothesis testing, regression analysis and algorithm implementation with R.

Data Scientist Intern | *UNDP* Jun. 2019 - Dec. 2019
- Achieved 83% accuracy in forecasting the sever rain fall using PCA, random forest and regression analysis.
- Participated in research of poverty prediction for African countries using CNN and satellite night light image data.

Research Assistant in Law Economics | *University of Waterloo* Jan. 2017 – Apr. 2017
- Improved the speed of data collection by 400% for Canadian legislative activities by designing Python algorithms.
- Extensive investigation and resource checking for legal publications.

EDUCATION

University of Waterloo
- **Master of Mathematics, Statistics |** *GPA: 88/100 (3.89/4)* Sep. 2019 - Aug. 2020
- **Bachelor of Arts, Honors Economics Joint Honors Mathematics** | *GPA: 90/100 (3.88/4)* Sep. 2016 - Apr. 2019

- **Relevant Courses**: Computer Vision, Machine Learning, Bayesian Statistics, A/B testing, Time Series, GLM.
- **Publication:** "L1-Regularized Functional Support Vector Machine." (to be submitted to AAAI).

PROJECT

Machine Learning: Life Satisfaction Prediction, Kaggle Competition Feb. 2020 - Apr. 2020
- Achieved 88.3% AUC scores in predicting satisfaction level by blending KNN, Naïve Bayes, random forest, GLM, SVM, GBM using Scikit-learn and implementing deep neural network using Keras.

R Package: fdp, Functional Data Preprocessing Package Jan. 2020 - Apr. 2020
- Developed a functional data processing package including tools for data smoothing and dimension reduction.
- Conducted massive unit tests and data simulations for testing package stability.

Computer Vision: Deep Image Prior, Semantic Segmentation, Semi-Supervised Segmentation Dec. 2019 - Apr. 2020
- Detected and analyzed prior information of DNN and its applications in denoising, inpainting and super-resolution.
- Performed supervised Semantic Segmentation by constructing a self-designed neural net using PyTorch.
- Implemented a Microsoft adopted semi-supervised Segmentation algorithm using graph cut and clustering.

A/B Testing: Netflix Revenue Optimization Apr. 2018 - Aug. 2018
- Maximized revenue gain by performing a response surface method on a simulated Netflix dataset.

GLM (Generalized Linear Model): Diseases Modelling Apr. 2018 - Aug. 2018
- Modeled over-dispersed data using mixed model methods for lung function deterioration in a Cystic Fibrosis study.

AWARD

Winner of The American Statistical Association DataFest 2019
- Led a team of 4 predicting and visualizing athlete fatigue level using times series and random forest.

Winner of The American Statistical Association DataFest 2018
- Led a team of 5 analyzing the demand and supply structure of the labor market in the next 5 years.