Boyang Fu

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Education

- **Rutgers, The State University of New Jersey** — **New Brunswick, NJ**
  Computer Science (Honors) & Mathematics — *January 2016 – May 2019*
- **Huazhong University of Science and Technology** — **Wuhan, China**
  Bioinformatics (National Science Talent Training Base Class) — *September 2014 – January 2016*

Cumulative GPA: 3.98/4.0 **Major GPA: 4.0/4.0**

Relevant Courses

Linear Algebra	Linear Optimization	Graph Theory
Statistics & Probability	Database Management	Algorithms
Principles Prog. Language	System Programming	Intro to AI

Notable Projects

- **Image Classification:** *'Intro to AI - Course Project'*
  - Built Perceptron and Naive Bayes Algorithms from scratch for facial and digits recognition
  - Designed feature extraction algorithm based on multi-dimensional encoded pixel frequency and image object length-width ratio
  - Achieved an optimal prediction accuracy of 81%, and 91% with customized feature extraction algorithm, which is equivalent to the optimal accuracy provided by the neuron network
- **Software Developer National-Wide Employment Guidance:** *'Intro to Data Science - Course Project'*
  - Scraped massive job descriptions and information from GlassDoor and performed keywords extraction
  - Implemented customized multilayer perceptron classifier to perform software developer classification, which outperformed Decision Tree and Random Forest and achieved an final accuracy of 89%.
  - Discovered documentation similarity of SD related job descriptions by performing words embedding in job description technique, then applying both Multinomial Naive Bayes and Stochastic Gradient Descent to do binary classification (SD-related job or not), with a best final f1-score of 0.97.

Skills

- **Programming Languages:** C, C++, Python, Java, MATLAB, R, Bash, Scheme, Spark
- **Frameworks & Softwares:** TensorFlow, Maple, MySQL, Angular, MySQL, MongoDB
- **Operating Systems:** Windows, Linux (Ubuntu), Unix.

Research and Internship

- **Independent Study & Research Assistant** — **New Brunswick, NJ**
  Rutgers University CS Department, Advisor - Prof. Desheng Zhang — *May 2018 – now*
  Our research focuses on designing a new road construction algorithm that takes important road features (i.e. road type and speed limit) into account to generate a high-quality real-time map
  - Constructing the raw roadmap based on sparse GPS points and vehicle trajectory regeneration
  - Designing road construction algorithm through roadmap segmentation, then applying kernel density estimation on each segment to filter outliers and then use supervised learning to perform road type classification
  - Analyzing the influence of anomalies level and category to the passengers' waiting time based on spatio-temporal information.

- **Research Assistant, Bruins-In-Genomics (B.I.G.) Summer Program** **Los Angeles, CA**
  University of California, Los Angeles , Advisor - Prof. Sriram Sankararaman *June 2018 – August 2018*
  We developed a comprehensive benchmarking tool during the summer to compare 4 representative genome-wide association study algorithms under multiplexed simulated genetic architectures.
  - Designed data simulation algorithm based on multiple underlying genetic structural assumptions and parameters
  - Developed software to statistically compare the performance of different algorithms
  - Designed theoretical performance threshold to detect the statistical power of each SNP by estimating the non-centralized parameter under the linear model assumption
- **Aresty Research Assistant** **New Brunswick, NJ**
  Rutgers University Genetics Department, Advisor - Prof. Kevin Chen *July 2017 – December 2017*
  The objective of this research is to apply novel machine learning algorithms to the field of genetic association study
  - Processed raw data, including DNA binary transformation, normalization, and sparse matrix data processing
  - Researched performance comparison of dimension reduction algorithms (PCA and autoencoder) and performed feature analysis on SNPs dataset
  - Applied DNNregressor to predict the numerical phenotype value based on SNPs sparse matrix and studied the best hyperparameters combination with the help of computer cluster

Publications

- "MAC: Measuring the Impacts of Anomalies on Travel Time of Multiple Transportation Systems"
  Authors: Zhihan Fang, Yu Yang, Shuai Wang, Boyang Fu, Zixing Song, Fan Zhang, Desheng Zhang.
  Pending publication - submitted to Ubicomp 2019 on November 15^{th}
- "coMap: Urban Map Creation and Update Based on Heterogeneous Vehicular Fleets"
  Author: Zhihan Fang, Shuai Wang, Boyang Fu, Xiaoyang Xie, Fan Zhang, Desheng Zhang.
  Pending publication - submitted to MobiSys 2019 on December 15^{th}

Working Experience

- **Learning Assistant of Calculus II** **New Brunswick, NJ**
  Rutgers University Mathematics Department *September 2018 – May 2019*
- **Grader of Calculus III** **New Brunswick, NJ**
  Rutgers University Mathematics Department *September 2017 – December 2017*
- **Software Developer for Designing Data 101 Course Website** **New Brunswick, NJ**
  Rutgers University Computer Science Department *May 2016 – July 2016*
- **Captain of HUST Life Debate Team** **Wuhan, China**
  Huazhong University of Science and Technology *September 2015 – December 2015*

Award

- **Most Unique Hack Award in HackHer Competition, Rutgers University** February 2018
- **Best Use of Amazon Web Services in HackRU** October 2017
- **Academic Excellence Scholarship** 2016-2018
- **Rutgers University School of Arts and Sciences Dean's List** 2016-2018
- **Member of Phi Beta Kappa Society** from 2018
- **Member of Hall of Fame Data 101** from 2016

Activities

- **Member of RU Competitive Programming Club** March 2016 – May 2018)
- **Member of RU IEEE AI&ML Club** (September 2017 – May 2018)
- **Puzzle Designing in RU COGS Club** (September 2016 – January 2017)