Yongheng Li

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Summary

I am pursuing dual degrees in Computer Science and Mathematics. I have gained over 1-year professional experience via research and course assistantship. I am passionate about statistics/machine learning/deep learning and have been working on a few relevant projects apart from my curriculum. I am looking forward to working on challenging projects from June-2019 to utilize my skills as a full-time professional.

Education

Binghamton University, State University of New York — Expected: **May 2019**
Bachelor of Science in *Computer Science* & Bachelor of Arts in *Mathematical Science* — GPA: **3.84**/4.00

Technical Skills

Languages	Python, C++, C, C#, JavaScript, PHP, Java, R, SQL, HTML, CSS, X-86 Assembly, LaTeX
Software	Jupyter Notebook, Tableau, MATLAB, AWS, Git, GDB, NodeJS, MongoDB, Express, React, MS Office
Python Packages	NumPy, Pandas, SciPy, scikit-learn, TensorFlow, Keras, MapReduce, Spark, seaborn, matplotlib, ggplot2
Operating Systems	Linux, Mac OS, Windows, Raspbian

Professional Experience

Undergraduate Research Assistant, Real-Time Embedded Systems Laboratory — **Apr 2018-Present**
Binghamton University, Watson School of Engineering and Applied Science

- Formulated the device-to-device link establishment challenge in heterogeneous 5G networks into a Multi-Armed Bandit problem
- Explored various state-of-art, such as Epsilon-Greedy, Upper Confidence Bound, and Thompson Sampling, to find optimal routing paths
- Improved Thomson Sampling supported by Beta distribution with a selection technique to overcome the wireless channel randomness
- Enhanced the overall throughput by up to 15% compared to the best performing baseline in the dense and noisy environment

➢ Investigated techniques to approximate nearest neighbor search in high dimensional space, such as product quantization and LSH
➢ Explored the FAISS k-selection technique proposed by Facebook as an opensource for efficient similarity search with GPUs

Course Assistant, CS 105 - Introduction to Computing — **Aug-Dec 2016**
Binghamton University, Watson School of Engineering and Applied Science

- Provided guidance in data analysis using Microsoft Access and Excel by holding two weekly laboratory sessions with 50 students
- Graded assignments based on given rubrics and provided students with comprehensive feedbacks to enhance their performance
- Collaborated with a team of four Course Assistants via weekly meeting and actively contributed new ideas on course improvement

Project Experience

Twitter Sentiment Analysis via Deep Learning — **Aug 2018-Present**

- Investigated machine learning and deep learning techniques to perform sentiment classification on large Twitter user datasets
- Performed various feature engineering on unstructured textual data and explored word embedding techniques (Word2Vec and GloVe)
- Designed and implemented a robust CNN model consisted of 4 convolution layers and an RNN model with LSTM using Keras
- Archived a maximum classification accuracy by 83.33% using the proposed CNN model and by 83% using the RNN model

Stock Pair-trading via Machine Learning — **May-Aug 2018**

- Designed an algorithm that navigates a high-dimensional search space to find tradeable stock pairs among 1500 stocks
- Implemented Principle Component Analysis to reduce the dimension of the stocks' data and extract the latent common factors
- Identified candidate stock pairs by applying DBSCAN clustering algorithm with k-distance plot to find its optimal epsilon value
- Visualized clusters in high dimensional space in 2-dimension using t-SNE and analyzed datasets using Matplotlib and Seaborn

Website for Information Retrieval — **Jan-May 2018**

- Built a website with front-end and back-end functionalities using JavaScript which allows users to retrieve key-words via document search
- Implemented RESTful APIs to handler server-side routings using Express and used MongoDB as the internal database at the back-end
- Designed interactive user interfaces at the client-side using React and utilized Mustache template to dynamically render HTML pages

Branch Predictor Simulation — **Feb-Mar 2018**

- Implemented traditional branch predictors, such as bimodal, gshare, and tournament predictors, which improves the pipeline efficiency
- Enhanced the prediction accuracy by implementing a proposed branch predictor with perceptron which makes use of long branch histories

Virtual Memory System — **Nov-Dec 2017**

- Designed and implemented a virtual memory system that simulates page fault handling mechanism in an operating system
- Built a memory model that tracks page faults, TLB miss/hit, memory read/write accesses and disk accesses for an application

Publication

Robust Communication via Multi-Armed Bandit at Link and System Levels in Heterogeneous 5G Networks — **2019**
Under the review process of MDPI - Big Data and Cognitive Computing journal's special issue on Real-Time Data Services for the IoT

Course Works

Computer Science	Intro to Artificial Intelligence, Database Systems, Wireless Networks, Web Programming, Data Structure & Algorithms, Automata Theory, Operating Systems, Computer Architectures, Programming with Objects
Mathematical Science	Mathematical Statistics, Probability Theory, Ordinary Differential Equations, Intro to Financial Mathematics, Number Systems, Calculus, Linear Algebra, Discrete Mathematics