WENKANG WEI

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SUMMARY

I'm a second-year master student with 5 years of experience in programming and 3 years of experience in Machine Learning. I'm actively looking for a full-time job or summer internship of **Machine Learning Engineer**.

EDUCATION

Clemson University, SC

- Master of Computer Engineering, Minor of Computer Science — Expected in May 2021 *GPA 3.79/4.0*
- Bachelor of Electrical Engineering — May 2019 *GPA 3.84/4.0*

TECHNICAL SKILLS

- **Programming:** Python (PyTorch, Tensorflow, Pandas, Sklearn), PostgreSQL, C/C++, MatLab, Latex, Markdown
- **Software Toolkits and Techniques**: Linux, Git/Github, Docker, GCP (Google Colab), AWS (EC2, RDS), Object-Oriented Programming (OOP)
- **Distributed Computing:** Apache PySpark, Hadoop MapReduce, Databrick Distributed Cluster
- **Data Analysis and Visualization:** Exploratory Data Analysis (EDA), Seaborn, Matplotlib
- **Data Processing:** Data Pipeline Construction, Data ETL (Extract, Transform, Load), Data Wrangling
- **Machine Learning:** Recommendation System (Matrix Factorization, etc), Deep Learning (CNN, RNN), Classification, Regression, Clustering
- **Model Evaluation and Improvement:** Cross-Validation, ROC, AUC, Feature Importance, Ensemble Learning, etc.
- **Statistical Analysis:** Hypothesis Testing (T-test, Chi-Square, Z-test, F-test), A/B testing, Bayesian Theorem

PROFESSIONAL EXPERIENCE

Machine Learning Research Assistant — Clemson University, Summer 2020-Current

- Proved convergence and convergence rate of Multiple Update Algorithm (MUA) in Non-Negative Matrix Factorization Problem
- Formulated Matrix Factorization Problem into Constraint **Optimization** Problem, simplified problem with Linear Algebra, Lagrange multiplier
- Utilized Lipschitz gradient, convex optimization to prove the convergence and convergence rate of MUA algorithm
- Implemented **MUA** and **ALS (alternative least square)** algorithm in Google Colab and Matlab to verify convergence results
- Wrote a paper in AAAI format using **Latex** (unpublished due to copyright)

Team Leader in Kaggle Competition: Cassava Leaf Disease Image Classification — Kaggle, Fall 2020- Current

- Lead 2-person team to build a multi-task image classification system to classify cassava leaf diseases via a noisy cassava dataset from real world
- Construct data pipeline in **PyTorch** to extract and load Cassava leaf disease image dataset (5.76GB compressed data)
- Leverage data reduction methods to analyze data distribution and applied Image augmentation (cutout, mixup, etc) to transform images
- Apply and tune **efficient-net** and **visual transformer** models in multi-task classification task with label smoothing, early stopping, weight decay and improve model accuracy in public score by 3% using ensemble learning
- Achieve **0.905** accuracy in public score and rank **top 3% out of 40 teams** in kaggle leaderboard currently

Leader in Human Activity Time Series Data Collection (20GB) and Analysis — Clemson University, Fall 2020-Current

- Write tutorial documents in Markdown in Github and coach **10 students** to collect wrist motion data from daily life to analyze eating behaviors
- Mentor and assist each student to collect, clean and label 2GB individual data in 2 weeks and transform time series data for data wrangling
- Construct robust data pipeline to solve buffer overflow problem to extract, load and transform **large-scale time series dataset (20GB)** in **1 min**
- Visualize and analyze imbalanced data with seaborn and smooth data using moving average for data augmentation using Pandas, Numpy
- Build Convolution Neural Network to classify and segment eating period and achieve the **best weighed accuracy 96%** in cross validation

SELECTED PROJECTS EXPERIENCE

Recommendation System based on MovieLens 25M dataset (PySpark, Hadoop, HDFS, SQL) — Fall 2020

- Constructed a recommendation system using **Collaborative Filtering** and **Matrix Factorization** methods to analyze the genres contributing to ratings and make recommendations to users
- Utilized **PySpark and SQL** to load, query and analyze movielens dataset (**25 million ratings)** in databrick distributed cluster platform
- Implemented and applied mapper, reducer functions in **Hadoop** File system to analyze different movie genres to ratings

Youtube Comments Analysis and Pet Owners Classification (PySpark, SQL, Databrick Cluster) — Fall 2020

- Utilized **PySpark** and **PostgreSQL** to load, query and explore Youtube comment text data (about 1GB after decompression)
- Built data pipeline and applied Term-Frequency-Inverse Document-Frequency(**TF-IDF**) to transform text data into numerical data
- Applied Logistic Regression, Random Forest, Gradient Boosting machine in PySpark to classify cat or dog owners from comments
- Achieved **92%** prediction accuracy on test set using grid search and cross validation

Bank Customer Churn Prediction on Kaggle Bank Customer Dataset (Python, Seaborn, Pandas) — Fall 2020

- Visualized and analyzed bank customer dataset via data manipulation toolkits: **pandas, numpy** and visualization toolkits: **seaborn, matplotlib**
- Preprocessed and transformed categorical data for machine learning model training using **sklearn** and normalization techniques
- Established data pipeline and ML models like Random Forest, Logistic Regression, SVM, and evaluated models using ROC,AUC
- Improved Models Accuracy from **80% to 86%** by model selection, cross validation and feature selection, L1 Regularization techniques

IMDB Movie Rating Positive/Negative Sentiment Classification (Python, Tensorflow) — Summer 2020

- Extracted IMDB movie rating text dataset (1.4GB) using Beautiful-Soup and cleaned data by stemming, removing stop words
- Applied **Word Embedding**, **Bag of Word** model**, TF-IDF** Techniques to transform text data into different representations for model training
- Designed Convolution Neural Network in **Tensorflow** and applied ML models (Support Vector Classifier, Random Forest, etc) for classification
- Evaluated model performance and achieved model test accuracy **88%**

HONOR

Eta Kappa Nu (HKN) (Spring 2018 - present); Golden Key Honor Society (Fall 2017- present); President's List (Summer 2019);
Dean's List (Fall 2016 – May 2019); Best overall hack award of CUhackit Competition (Spring 2018);