Chengyi (Jeff) Chen

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**SKILLS**

**Technical Skills:** Python (Sklearn, Pandas, Numpy, Scipy, Matplotlib, PyTorch, Pyro, PySpark, Cvxpy, PyMC3, Tensorflow) | SQL

**WORK & LEADERSHIP EXPERIENCE**

[**Plutus Mazu**](https://www.plutusmazu.com/) **Singapore, Singapore**

*Data Scientist* June 2021 – Dec 2021

* Quant Team | Technologies used: sklearn, imblearn, optuna, talib, plotly, dash, scipy, numpy
  + Machine Learning Wrapper over Trading Strategies
    - Extended sklearn library for proprietary trading strategies
    - Implemented novel machine learning algorithms such as a Quantile Ensembler and Residual Regressor model with appropriate cross-validation techniques.
    - Built an end-to-end inference / model selection pipeline from scratch, including data preprocessing, feature engineering, novel dimensionality reduction methods, novel feature selection methods, hyperparameter optimization, user interface for choosing “best” model from the pareto-frontier of multi-objective optimization problems and converting it into deployable, regularly retrained models

**Gojek Singapore** **Singapore, Singapore**

*Data Science Intern, Pricing Team* May 2020 – Aug 2020

* Dynamic / Surge Pricing Team | Technologies used: numpy, tensorflow, cvxopt, cvxpy
  + Contextual Bandits: Off-Policy Evaluation and Error Bound Calculation
    - Research on off-policy value estimators:
      * Bias, Variance, Mean-Squared Error Analysis of 1. Inverse Propensity Scoring (IPS), 2. Doubly Robust, 3. Self-Normalized IPS, and 4. Maximum Empirical Likelihood estimation.
    - Implemented and compared error bounds for the IPS estimator such as t-distribution, asymptotic gaussian, clopper-pearson, bootstrapping, and ones derived from Hoeffding and Bernstein inequalities
    - Investigated convergence of off-policy value estimates of the target policy to the actual value

[**Shopee Singapore**](https://shopee.sg/blog/career-intern-insider-shopee-singapore-jeff-chen/) **Singapore, Singapore**

*Data Science Intern, Marketing Science* Dec 2019 – May 2020

* Churn Prediction Team | Technologies used: pyspark, pyspark sql, pytorch, pyro, shap, sklearn, plotly
  + Model Performance Tracking and Explanation:
    - Presented contribution of features used in LightGBM models to marketing managers and key stakeholders using SHAP
    - Used Plotly to generate animations displaying incumbent model’s performance across all 7 regional markets
  + Model Exploration and Feature Engineering:
    - Explored other pyspark ml, H2O’s AutoML binary classifiers and MMLSpark survival models
    - Reformulated Churn Prediction into a time series regression problem instead of binary classification and developed a PyTorch Sequence2Churn model to predict time to churn
    - Developed end-to-end feature engineering pipeline to process raw data from parquet files on Hadoop, producing both static and time series features
* Voucher Sensitivity | Technologies used: causallift, pyro
  + Researched on amount of uplift generated using different vouchers and implemented code to estimate the Conditional Average Treatment Effect using Inverse Propensity Weighting / Scoring

**EDUCATION**

**University of Southern California (USC) Los Angeles, California**

*M.Sc. in Analytics and B.Sc. in Computer Science Business Administration* December 2021

Grad GPA: 4.00 / 4.00 | UGrad GPA: 3.84 / 4.00 | SAT: 1550

**PROJECTS**

[**Evolving FPGA Research with Center for AI in Society’s Student Branch (CAIS++)**](https://github.com/pelillian/fpga-evolution) September 2019 – Present

* Evolving Field Programmable Gate Array (FPGA) circuit configurations to become universal function approximators competitive with neural networks using genetic algorithms and evolutionary strategies such as novelty-search with a variety of distance metrics (e.g. wasserstein) and multi-objective optimization.

[**Exploring Housing Prices in Singapore**](https://jeffchenchengyi.github.io/course-work/udacity/exploring-house-prices-singapore-part-3-crispdm.html) May 2019 – August 2019

* Scraped [www.99.co](http://www.99.co) (Singapore Property Portal) for property features and transaction history using BeautifulSoup.
* Performed Clustering (K-means) and Regression (Random Forest) analysis on the data, followed by a brief exploration of the most popular condominiums in Singapore.

[**Udacity Data Scientist Online Nanodegree Program**](https://graduation.udacity.com/confirm/2LGCCKNA) January 2019 – August 2019

* Completed projects ranging from building Recommendation Systems using Matrix Factorization techniques (Singular Value Decomposition) for Collaborative Filtering to predicting Customer Churn with the PySpark API.