CESAR ACOSTA-MEJIA

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Six years of experience analyzing highly complex data, building advanced data mining models to predict market outcomes useful to improve decision making in Marketing Analytics, Financial investing, and business operations (supply chain analytics, logistics). Outstanding skills to finding data insights for problem solving and process optimization.

EDUCATION

- Ph.D.,M.S. Statistics, The University of Texas at Dallas *2016*

EXPERIENCE

- Data Analytics Consultant *2013 - present*
- USC, Viterbi School of Engineering, MS Analytics, program advisor and instructor *2016 - present*
- USC, Viterbi School of Engineering, MS Financial Engineering, program instructor *2014 - present*

Ample experience in optimizing and applying Machine Learning to solve real-world problems through the use of advanced statistical analysis to build prediction and classification models in applications such as Marketing Research, Portfolio Optimization, Volatility Forecasting, and Automated trading. Experience using classification methods, gradient boosting, Random Forests, KNN, and K-means; and regression methods, Logistic, Poisson, Multinomial, and Ridge regression. Clustering methods such as Principal Components Analysis, Discriminant Analysis, and Hierarchical clustering. Also, Web analytics and Neural Networks, both with *R* and Python.

PROJECTS

- Improved an S&P 500 Investment tracking portfolio by changing the assets allocation to reduce the associated risk. Investment portfolios with and with no assets' shortselling were derived. An optimization model with cardinality constraints was considered for each case. The portfolio's risk was reduced in term of the return's volatility. Portfolios based on other risk measures such as inverse volatility portfolio, equal-risk-contribution portfolio, and, maximum diversification portfolio, were considered. *Jan 2017 - Dec 2017*
- Optimized Marketing Resource allocation to improve customer acquisition and retention. The nonlinear relation between marketing efforts and customer acquisition and retention was derived. Values of annual spending on acquisition and retention that maximize return on investment were found. *Jan 2018 - May 2018*
- Compared the performance of Random Forest with Multinomial Regression to classify customers into several market segments. It was shown that Random Forest and Ensemble methods outperform multinomial regression models in terms of predictive performance. *Jan 2018 - Dec 2018*
- Mixtures-based Value at Risk Estimates of Financial Stocks. It is generally believed that if the true loss distribution is heavy-tailed, as compared to the normal, then the risk is higher. In general this is not the case. We found that there are instances where normality overestimates (and the mixture distribution underestimates) the observed market risk *Aug 2017 - May 2018*

SKILLS

Programming	Data Wrangling (*R*:`stringr,dplyr,lubridate`, Python: Numpy, Pandas) Web scrapping (*R*:`rvest`)
Visualization	Plotting (*R*:`ggplot2,car,corrplot`, Python:`matplotlib`), Mapping (*R*:`ggmap`), JMP
Stat Analysis	*R* libraries `MASS,car,boot,`, SAS, JMP, Python: Scikit-learn
Predictive	Time Series (*R*:`xts,zoo`), Clustering (*R*:`cluster,mclust`), Regression (*R*:`leaps,glmnet`), NN (`nnet`)
Classification	*R* libraries `class,tree,randomForest,gbm,kernlab`, Python: Scikit-learn
Dashboards	Tableau, *R*:`shiny`

AUTHORED BOOK

Financial Derivatives, 2018. Textbook for a course in financial derivatives, portfolio optimization, and hedging. The book includes examples and exercises in *R* to construct optimal portfolios, to estimate Value at Risk, to price European and American options, among other applications. It also introduces Stochastic processes and stochastic calculus for the Black and Scholes formulas, and covers Monte Carlo simulation of Brownian motion to estimate the price of some exotic options. It shows how to use libraries `RQuantlib, Rmetrics, rugarch, fOptions, fExoticOptions` for financial modeling.