Mengyao Huang

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EDUCATION

University of Michigan   Ann Arbor, MI

Department of Mathematics

Master of Science in Quantitative Finance and Risk Management & Data Science Certificate Program; GPA: 3.6/4   *Sept. 2017 - May. 2019*

Relevant Courses: Numerical Analysis, Stochastic Analysis, Statistical Learning, Data Mining, Machine Learning, AI Foundations, Data Manipulation and Analysis, Financial Mathematics, Computational Finance

Dalian University of Technology   Dalian, China

School of Mathematical Sciences

Bachelor of Science in Mathematics and Applied Mathematics & Bachelor of Science in Finance; GPA: 3.6/4   *Sept. 2013 - Jun. 2017*

Relevant Courses: Calculus, Advanced Algebra, Ordinary Differential Equations, Optimization Methods, Complex Analysis, Real Analysis, Functional Analysis, Multivariate Statistical Analysis, Time Series Analysis, Game Theory, Operations Research, Econometrics

RESEARCH INTERESTS

Machine Learning and Statistical Learning in Marketing Research, Recommendation System

RESEARCH AND WORKING PROJECTS

- **Marketing Research**: Advisor: Fred M.Feinberg   *May. 2018 - present*

  Topics: *Data Preprocessing, Machine Learning Algorithms, Bayesian Inference, Matrix Factorization, Choice Model*

  - Integrated databases and performed data cleaning with Python Pandas including outliers filtering, missing data imputation, categories reduction, dummy variables creation and data normalization

  - Operated data visualization for CRM database with Python ggplot and matplotlib; calculated statistical metrics for further inference

  - Implemented customer clustering/classification algorithm for CRM database with K-means, K-modes (GOWER distance based), Random Forest and Naive Bayes in Python and package "MatchIt" in R

  - Learned **Bayesian Mixture Model**, **EM Algorithm**, **Gibbs Sampling** and **Multinomial Logit Model** with mixed effect

  - Implemented Multinomial Logit Model, **Nested Logit Model** (with/without cross validation), **Linear Mixed Effects Model** and **PCA** analysis with R and Python scikit-learn & mnlogit

  - Implemented **Variational Inference** with Normalizing Flows algorithm (Rezende & Mohamed, 2016) in Python with MNIST dataset

  - Wrote literature review abstract related to Low-rank **Matrix Approximation**, **Latent Factors Interpretation** and **Recommendation System**; implemented **Bayesian Matrix Factorization** (with/without side information) in Python with MovieLens dataset

  - Implemented **Variational Autoencoder** and **Gaussian Mixture Model** in Pyro (with/without Poutine library)

  - Performed **Discrete Choice Model** analysis in the context of Choice Set Formation (Salisbury & Feinberg, 2012; Bruth et al., 2016); helped with R package **DCmods** modification, output aggregation and visualization

  Working Projects:

  - Construction and interpretation of DCmods vignettes

  - Variational Autoencoder application in data fusion and Unbiased Implicit VI implementation

  - Matrix Factorization application in marketing data imputation

- **Social Structure research in Strategy**: Advisor: Michael Jensen   *Mar. 2019 - present*

  Topics: *Web Scraping and Data Integration, Selenium Automation Testing, Natural Language Processing*

  - Performed web scraping (IMDb, Wikipedia, BookMyShow, Box Office Mojo and etc) to collect seasonality info and film directors' demographic info, trivia & images with Python Pandas & Beautiful Soup and VBA in Excel

- Collected user/critic ratings and comments for films; implemented transparent text analysis with Linguistic Inquiry and Word Count (LIWC) and Topic Modeling with Python scikit-learn (Latent Dirichlet Allocation)
- Set up scraping program through Selenium driver to automate login & searching process; collected rankings of casts and directors by DOM & HTML parsing and text pattern matching

- **Optimization in Principal-Agent Problem**: Advisor: Nicolas Hernandez *Nov. 2017 - Oct. 2018*
  - Implemented nonpolynomial approach of actions related agent's utility maximization problem (Renner & Schmedders, 2015)
  - Tested algorithm efficiency and global optimality with both MATLAB GloptiPoly and modified fmincon method

- **Optimization in Asset Liability Management**: Advisor: Guotai Chi *Nov. 2015 - Jun. 2017*
  - Implemented optimization algorithm of worst-case Conditional Value-at-Risk(WCVaR) under mixture distribution and kernel density estimation (Zhu & Fukushima, 2009) with MATLAB
  - Modified robust portfolio optimization by introducing credit rating transition matrix

- **Complex Ecosystem Evolution Model**: Advisor: Qiuhui Pan *Mar. 2015 - May. 2016*
  - Introduced external factors like water distribution to complex ecosystem; adopted Partial Differential Equations to measure energy flow and implemented dynamic Monte Carlo (DMC) simulation with MATLAB

PROFESSIONAL EXPERIENCE

Washtenaw Community College Ann Arbor, MI
Research Analyst in Institutional Research and Analytics Dept *Aug. 2019 - present*
Mentor: Mourad Roger
- Updated databases & annual reports using Microsoft Access and Power BI
- Conducted **Excess Credits Research** in community college system by examining credits distributions in the context of particular degree programs (Zeidenberg, 2012); further improved accuracy by considering transferred credits and candidates with more degrees

BOHAI Securities Co., Ltd Tianjin, China
Researcher in Quantitative Trading Division *Jul. 2016 - Aug. 2016*
- Improved stock price cycles estimation by implementing weighted Fourier Transform algorithm; strengthened the performance of quantitative timing model by adopting year-on-year series and adjusting tuning parameters including length of subsequences

AXA Group, Hong Kong Branch Hong Kong, China
Assistant Analyst in Market Research Department *Jan. 2016 - Feb. 2016*
- Developed trading strategies based on Fundamental Analysis and indicators including MACD, KDJ, SAR and price-volume relationship
- Analyzed financial time series in EViews; applied multivariate linear regression model and GARCH model to predict Hang Seng Index

SEMINARS

- **Quantitative Research in Marketing**: Organized by Prof Puneet Manchanda *Oct. 2019 - present*

- **Special Topics in Marketing**: Organized by Prof Fred.M.Feinberg *Jan. 2019 - Feb. 2019*

HONORS AND ACTIVITIES

President of DUT Mathematical Modeling Association *Sept. 2015 - Sept. 2016*
(DUT Outstanding Student Association Award) *May. 2016*
Certificate of DUT Innovation Practice Training 3-year Program (Mathematical Modeling track) *Jul. 2016*

Third prize in National Mathematical Modeling Contest *Nov. 2015*
First prize in Mathematical Contest in Modeling in Northeastern China (Top 5%) *May. 2015*
DUT Technological Innovation Award (Top 5 out of 180) *Oct. 2014*

PERSONAL

- **Languages**: Mandarin Chinese (native), English (TOEFL iBT: 105, GRE: 325+4.5)
- **Skills**: Fluent in Python, Pytorch-Pyro, R, MATLAB and C++/C; intermediate in SQL, Stan, Microsoft Access, and EViews
- **Interests**: Sketch, Play squash, Social psychology(recent)