Lin Deng

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CONTACT INFORMATION

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RESEARCH INTERESTS

Bayesian Statistics, Applied Machine Learning, Pricing Strategy, Operation Research, Data Science

EDUCATION

University of Minnesota, Twin Cities — Minneapolis, MN USA
M.S., Industrial and Systems Engineering (Analytics) — Sep 2017 - Jun 2019
GPA: **3.31/4**
Advisor: Prof. William L. Cooper

Nankai University Binhai College (with outstanding graduate honor) — Tianjin China
B.M. — Industrial Engineering — Sep 2007 - Jun 2012
GPA: **87.19/100** (rank:**1/65**)
Thesis: *Research on Chinese Enterprise Supplier Selection and Evaluation Mechanism in the Big Data Era*

COURSES TAKEN

Optimization, Stochastic Process, Machine Learning, Decision Analysis, Data-Driven Decision Analytics, R Programming, Applied Regression Analysis, Operation Research, Principles of Economics, Probability and Statistics, Statistics, Database and SQL Programming, Accounting and Financial Management

RESEARCH PROPOSAL

Gaussian Process for Online Real-Time Pricing

RESEARCH EXPERIENCE

Price Competition and Seats Allocation within International Airline Alliance
China Eastern Airlines – Commercial Committee — Jan 2020 - present

- Designed to model the relationship between sales price and seat allocation in subgroups within the alliance (e.g., codeshare flights) to increase expected profits.
- Estimated seat load factor measurement error by days before departure base on past 5-year flight data and stochastic demand simulation.

An Empirical Study of the Bid Forecast and Pricing Strategy for the North American HVAC Market
(sponsored by Daikin Applied Americas) — Sep 2018 - Dec 2018

- Designed a pricing strategy based on historical bid data and the bidding process. Predicting the bid outcome in the North American HVAC market by using an ensemble Machine Learning method that combines logistic regression and GBDT, which was inspired by *Facebook Ads Clicking Prediction Method*. Achieved prediction accuracy: 81%, recall (true positive rate): 82%
- Set up a Back-Testing pricing strategy base on Daikin's bid data for both strategy design and bid price adjustment. Provided an efficient solution to clean and process bidding & component data and deploy it to models. Obtained a strategy of average profit of about 9% annual return over the past 10+ years' bid log

Handling Imbalanced Data – American Census Income Data — Mar 2018 - May 2018

- Collected statistics on the income - American Census data. Used the SMOTEBoost and RUSBoost to classify the imbalanced income data
- Use the NaiveBayes classifier to build the model and use cross-validation to select the number of features to include. And use Bayesian networks to find the internal relationships between features and labels

Modeling Survivability of Breast Cancer Jan 2018 - Mar 2018
(sponsored by University of Minnesota Public Health Dept)

- A comprehensive breast cancer cell survivability models enable identifying and targeting women at high-risk, while reducing too-early interventions in those at low-risk
- Adjusted the DeepType framework that performs joint supervised classification, unsupervised clustering, and dimensionality reduction to learn breast cancer related data with high-dimensional clustering structures.
- Results are used to recommend screening guidelines for potential patients and the design of future treatment assessment models

Work Experience

China Eastern Airlines – Commercial Committee Shanghai China
Strategic Pricing Consultant Dec 2019 - present

- Query and analyze passenger ticket data to gain market knowledge, and leverage that knowledge to inform future pricing decisions
- Create deal negotiation models and parameters for China - Australia Airline Sales that maximize Revenue and support commercial objectives
- Future work will involve Game Theory model for Airlines Pricing

Guoyuan Agricultural Insurance CO., LTD, Hefei, Anhui China
Data Scientist Intern Jun 2018 - Aug 2018

- Provided an efficient solution to import and clean insurance data and deploy it to SQL databases to improve efficiency in update
- Maintained a website to put the project's related information online to reduce document cluster and accelerate data preparation pipeline
- Developed an advanced R function library to perform effective data analysis, including covariates selection, and automatically generate reports for more than three projects

Honors and Awards

First-Class Scholarship for Outstanding Students	2014
Second-Class Scholarship for Outstanding Students (twice)	2015, 2016
NKBH Merit Student Award	2015
Outstanding Graduate	2017

Skills

Programming: Python, R, SQL, Matlab
Software and Tool: Scikit, PyTorch, PySpark, RShiny, Rmarkdown, Tableau, AMPL
Certificate: Six Sigma Green Belt (IISE Institute of Industrial & Systems Engineers)
Languages: English(professional), Chinese(native)
Standard Test: GRE: 150V, 170Q 2AW (Sep 04, 2016)

Abstract of Research Proposal

Gaussian Process for Online Real-Time Pricing

Traditional machine learning methods normally tackle problems with given static datasets, many online retailing data was created, collected, and labeled through real-time interactions with customers and users. Therefore, understanding how to apply dynamic pricing in retailing under the Big Data scale is of increasing importance in both practice and research. The motivation of this work is presenting real-time product preference pricing strategies from high volume and high dimensional datasets. Due to previously insufficient data samples and conventional dynamic pricing strategy was usually designed based on specific, well-defined scenarios, which cannot promise the expected revenue expectation. This research focuses on given the markets heterogeneity and high-dimensional online retailing data, introduces a data-driven non-parametric inference model to improve demand estimation for better pricing decisions. Findings from this work can help the retailer to give precise pricing strategy in revenue management and even to optimize advertising, recommendation systems, and many more applications.