Hongzhang Shao

CONTACT

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RESEARCH

I work with data and mathematical models. My work seeks to introduce interpretable and computationally tractable models that loosen existing restrictions and capture new aspects of the real world. A major tool in my research is **conic programming**.

Over the past few years, I've been studying **revenue management** problems in retailing (pricing, assortment planning, demand forecasting, etc.). Now I'm getting started on similar problems, but with application in **transportation systems**.

EDUCATION

Georgia Institute of Technology, Atlanta, USA

Ph.D. in Operations Research (expected) June 2022
– Advisor: Anton Kleywegt
– Committee: Arkardi Nemirovski, Huseyin Topaloglu, He Wang, Zizhuo Wang

M.S. in Operations Research December 2015

Zhejiang University, Hangzhou, China

B.E. in Automation & Engineering June 2014
– Advisor: Guang Li

Morningside Scholar in China Studies

PUBLICATIONS

In Preparation

– Kleywegt, A. J., Li, Y. & Shao, H., *A Markov Decision Process Model for Drivers' Relocating Behavior in Ride-Hailing Systems.*

Preprints

– Kleywegt, A. J., & Shao, H. (2021). *Optimizing Pricing, Repositioning, En-Route Time, and Idle Time in Ride-Hailing Systems.* ArXiv:2111.11551.

  – slides available on personal website.

– Kleywegt, A. J. & Shao, H., *Joint Price and Assortment Optimization under Discrete Choice Models: A Conic Programming Framework.*

– Kleywegt, A. J. & Shao, H., (2020). *Tractable Profit Maximization over Multiple Attributes under Discrete Choice Models.* ArXiv:2007.09193.

  – slides available on personal website.

– Kleywegt, A. J. & Shao, H., (2020). *Joint Estimation of Discrete Choice Model and Arrival Rate with Unobserved Stock-out Events.* ArXiv:2003.02313.

Experience

Cardinal (Shanshu) Operations LLC, Shanghai, China

Operations Research Intern Summer 2019

– Led a revenue management (product pricing) project for a leading beer manufacturer.
– Built multi-SKU (nested logit) choice models to analyze consumer behavior in major cities.
– Implemented joint price optimization over SKUs, channels & cities.

WestRock Company, Atlanta, USA

Operations Research Intern Summer 2017

– Implemented a spare parts inventory control model & a 3D bin packing optimization model.
– Developed demo web-apps with dynamic data visualizations for both projects.

Gimme Vending LLC, Atlanta, USA

Data Scientist Consultant February 2016 - March 2017

– Developed product assortment planning algorithms based on discrete choice models.
– Implemented the algorithms on AWS (Linux server) with PostgreSQL, R & RStudio Server.
– Conducted 2 field tests on 10 machines; Both resulted in $> 10\%$ improvements on sales.
– Developed & deployed an assortment planning web application with RMarkdown & Shiny.

Teaching

Instructor:

– ISyE 3133 Engineering Optimization (Studio) Spring 2021

Teaching Assistant:

– ISyE 6383 Supply Chain Operations Fall 2018, Fall 2019, Fall 2020, Fall 2021
– ISyE 6414 Regression Analysis Summer 2020, Summer 2021
– ISyE 6402 Time Series Analysis Spring 2020
– ISyE 6501 Analytics Modeling Spring 2019
– ISyE 4803 Warehousing Systems Spring 2018
– ISyE 3104 Supply Chain & Warehousing Models Fall 2017

Toolbox

Data Science: Python, R & Shiny, SQL, Amazon Web Services, Google Cloud Platform
Optimization: CVX, Gurobi, Mosek, PyTorch
Documentation: Markdown, LaTeX, HTML, CSS, Jekyll, Hugo

Interests

Quantitative Trader

Serious Amateur Magician

– Former President, Magicians Association of Zhejiang University
– Former Board Member, College Magic Union of Zhejiang Province, China

Intensive Reader on History, Sociology & Psychology topics