Zeynab Bahrami Bidoni

Data Scientist, Machine Learning Engineer, Operation Research Scientist

+7 years of work experience under daily interaction with companies and involved in real-world large-scale industrial projects for mining big data and solving problems

z.bahrami62@gmail.com

(001)-6786658149

Atlanta, United States

linkedin.com/in/zeynab-bahrami-bidoni-48807b58

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PROFESSIONAL PROJECTS

Risk-Sensitive Scenario-based Prediction of OnSite Demand and Completion Times in Modular Construction Projects

Research in GeorgiaTech granted by MiTek Co.

2021 - Present *Atlanta, USA*

Achievements/Tasks

- Mathematically modeled the on-site risks and disruptive events (such as rain, wind, crane Issue, lack of modules, reduces crew/labor/equipment, and plan/production discrepancy) using **Statistical Modeling and Machine Learning**
- Developed **a user interactive App in python** for setting different scenario assumptions and by generating a wide range of most probable scenarios from daily probabilistic distribution of risks and **mining over scenarios** and then providing some **visual outputs with managerial insights**
- The App outputs enables managers to better understand the different variables' impact on the building completion time windows, and consequently **to make better decisions about choosing among optional policies**. It has been used by MiTek Co. in several **real mega modular construction project**.

Predictive Scenario-based Demand Forecast and Customer Behavior Modeling for New Services in Hyperconnected Urban Parcel Logistics

Research in GeorgiaTech granted by SF-Express co.

2017 - 2020 *Atlanta, USA*

Achievements/Tasks

- Demand and customer behavior modeling for a service provider who wants to extend its offering system to much faster delivery service than ever done before.
- Studied a **big real-world Chinese megacity database** o n **SQL server** including one-year waybills and Barcode Scanning streaming (in terabytes volume) - Cleaning, detecting anomalies, and estimating Null/missed data was challenging.
- Conducted **ML** methods for **customer profiling and clustering** in terms of their preferences over services by capturing customers' sensitivities to the delivery-time observed in historical sales data and geo-categorization of orders in different time factors.
- Developed a scenario-based demand generation **App** with an interactive user-interface in **MATLAB** for generating a wide range of **demand scenarios** with **probabilistic patterns for customers' behavior** over all service offers with **dynamic pricing** and providing scenario-based **forecasted demand logs** for any arbitrary time horizon.
- The App's outputs are used to **feed a simulator** which models the last-mile delivery network of urban agglomerations in **Anylogic**, and it enables **testing service capability improvements** achievable by leveraging Physical Internet aligned transformation in a megacity.

SKILLS

Python | Numpy | Pandas | Tensorflow | R studio | MATLAB | C++ | SQL/NoSQL | Tableau | Power BI | Oracle Primavera | D3 JavaScript | HTML / CSS | ProblemSolving | Creativity | Teamwork | Integrity | Adaptability | Communication | Time Management

INTERESTS

Machine Learning | Data/Information Visualization | Demand Forecasting | Customer Behavior Modeling | Data Mining | Multivariate Statistical Analysis | Business Decision Analysis | Mathematical Modeling | Network Computing | Deep Learning | Pattern Recognition

EDUCATION

PhD | Machine Learning
Industrial & Systems Engineering Department,
Georgia Institute of Technology
08/2015 - Present *Atlanta, GA*

MSc | Computer and Information Science
Clark Atlanta University
08/2013 - 07/2015 *Atlanta, GA*

MSc | Industrial Engineering- System & Productivity Management
Industrial Management Institute (IMI)
2007 - 2010 *Tehran, IRAN*

B.Sc.| Applied Mathematics
Tarbiat Moallem University (Kharazmi University)
2001 - 2005 *Tehran, IRAN*

PROFESSIONAL PROJECTS

Data-driven Product Availability Optimization in the Dealer network of a Vehicle Manufacturing System

Research in GeorgiaTech granted by BRP Co. (2016)

Achievements/Tasks

- Developed an optimizing model of different products' volume availability through a dealer network considering product substitution probabilities

Large Scale Data Analysis and Knowledge Extraction in Communication Data

Research granted by Army Research Laboratory

08/2013 - 07/2015 *Atlanta, USA*

Achievements/Tasks

- Developing a **Generalizing PageRank** algorithm such that recognizing spider traps and **avoids the negative impact of spam pages.** This generalization enables the elimination of network anomalies- and increases the applicability of the algorithm to an array of new applications in networked data. Through experimental results, it **minimizes the effect of network anomalies**, and results in a more realistic representation of the network. (PageRank is used for ranking web pages by Google Co.)
- Define a novel and efficient **distance-based ranking** algorithm, called the "**Correlation Density Rank**" (CDR), which is utilized to derive the hidden **communities and leadership structures** and also to present an evolution graph of the organizational structure in dynamic networks.
- Proposed a novel approach with **low complexity** to **rank alternative complex networks** based on their performances considering occurring positive/negative frequent events as criteria which is capable of discriminating events occurring between important nodes over those between less significant nodes.
- Proposed a **utility-based** novel approach for **Ranking Quality of Service** and identifying the best service provider in Heterogeneous Wireless Networks by differentiating the quality of service (**QoS**) and providing a framework for analytical performance evaluation.
- Modeled an effective novel method to find the best solution with low computation time using the **CDR** algorithm on the **Virtual Allocation Network** (VAN) in order to obtain a **Reliability-based Optimization** aimed for **Task Allocation** in Distributed Computing Systems.

Modeling Multi-Criteria Reciprocal Decision Making

Industrial Management Institute | M.Sc. Thesis

2007 - 2010 *Tehran, IRAN*

Achievements/Tasks

- Modeled novel approaches and published papers for selection, sorting, assignment problems in **Multi-Criteria Reciprocal Decision Making.**

PAPER PUBLICATIONS

Full-text paper

Predictive Demand Modeling for New Services in Hyperconnected Urban Parcel Logistics

Author(s)

Z. Bahrami-Bidoni, B. Montreuil

Proceeding of IPIC 2021, 8th International Physical Internet Conference, June 2021

Full-text paper

Enabling Scientific Assessment of Large Scale Hyperconnected Urban Parcel Logistics: Scenario-based Demand and Customer Behavior Modeling

Author(s)

Z. Bahrami-Bidoni, B. Montreuil

Proceedings of IISE 2021 Conference

WORK EXPERIENCE

Research Assistant | Physical Internet Lab | ISYE, Georgia Institute of Technology | Atlanta, GA, USA (08/2015 - Present)

- Be involved in big industrial projects (granted by BRP co., SF-Express, MiTek co.) as a researcher in the field of mathematical/statistical modeling, machine learning, data mining, data cleaning, pattern recognition, scenario-based demand forecasting, customer behavior modeling, and risk analysis.

Research Assistant | Clark Atlanta University | Atlanta, GA, USA (08/2013 - 07/2015)

- Research in the field of network computing, data mining, and knowledge discovery granted by Army Research Laboratory had been done and novel approaches published in peer-reviewed journals and highly accredited conferences papers.

Project Controls Specialist and Management Advisor | KARA Project Management Co. | Tehran, Iran (2010 - 2012)

- Advising companies on leading their large-scale projects.
- Work with project managers and employees assigned to the projects and help them to properly plan their tasks through Oracle Primavera Software.
- Update schedules and planning for each projects, and communicate projects' progress updates through reports.

Adviser to CEO | Coasar Com R&D Group Co.| Tehran, Iran (2006 - 2010)

- Revising human resource system and job allocations in the company and recommending required changes to CEO
- Recognizing bottlenecks in the process of projects and providing solutions
- Developing reasonable formulation for calculating employees' salary
- Transforming the traditional project management system with implementing modern technics

HONOR AWARDS

First ranked Award of POOIA Student Scholarship

Professional Organization of Iranian Americans, January 2019.

ACM/IEEE Travel Grant

Student Paper Competition, The 10th ACM/IEEE symposium on Architectures for networking & communications systems (ANCS), 2014.

ACM MobiHoc Travel Grant

Poster competition in Airborne Networks & Communications conference, 2014.

5th rank on competition amongst 35 universities in Mathematics Olympiads

behalf of Tarbiat Moallem University (TMU) 2004 and 2005.

ORGANIZATIONS

Member of IISE (Institute of Industrial & systems Engineers)

Member of IEEE (Institute of Electrical & Electronics Engineers)

Member of ACM (Association for Computing Machinery)

Member of ASE (Academy of Science and Engineering)

Coordinator of ROSHD (Resource Organization for sexuality, Health and Development) (08/2019 - Present)

As part of the Serve, Learn, Sustain aspect of my second minor in the field of Iranian Studies with an emphasis on Technology, Media, and Society, Georgia Institute of Technology

LANGUAGES

English

Full Professional Proficiency

Persian

Native or Bilingual Proficiency

PAPER PUBLICATIONS

Full-text paper

Enabling Scientific Assessment of Large Scale Hyperconnected Urban Parcel Logistics: System Configuration and Assessment

Author(s)

Campos M., B. Montreuil, L. McGinnis, S. Kaboudvand, S. Kwon, Z. Bahrami-Bidoni, L. Faugere, S. Buckley

Proceedings of IISE 2021 Conference

Full-text paper

Reliability-based Optimization aimed for Task Allocation in Heterogeneous Distributed Computing Systems

Author(s)

Z. Bahrami-Bidoni, K. Shujaee

World Automation Congress (WAC), 31 July- 4 Aug 2016.

Full-text paper

A Recommendation Model for Reciprocal Negotiation Systems

Author(s)

Z. Bahrami-Bidoni, R. George

The IEEE Southeast Conference 2015

Full-text paper

A sorting method for group decision making with considering multi-criteria reciprocal judgments

Author(s)

Z. Bahrami-Bidoni, R. George, A. Makui

The IEEE Southeast Conference 2015.

Full-text paper

A smart assignment with consideration of multicriteria reciprocal judgments

Author(s)

Z. Bahrami-Bidoni, R. George, A. Makui

The Third ASE International Conference on Social Informatics – Harvard University, Dec 2014.

Full-text paper

Network Performance Rank: An Approach for Comparison of Complex Networks

Author(s)

Z. Bahrami-Bidoni, R. George

The Sixth ASE International Conference on Privacy, Security, Risk and Trust, Harvard University, Dec 2014.

Full-text paper

Network Service Quality Rank: A Network Selection Algorithm for Heterogeneous Wireless Networks

Author(s)

Z. Bahrami-Bidoni, R. George

Proceedings of the tenth ACM/IEEE symposium on Architectures for networking and communications systems, pp.239-240. ACM, 2014.

Full-text paper

Discovering Community Structure in Dynamic Social Networks using the Correlation Density Rank

Author(s)

Z. Bahrami-Bidoni, R. George

Proceedings of the SocialCom - Stanford, CA, USA. The Sixth ASE International Conference on Social Computing, 2014.

Full-text paper

A Generalization of the PageRank Algorithm

Author(s)

Z. Bahrami-Bidoni, R. George and K. Shujaee

Proceedings of the ICDS 2014, The Eighth International Conference on Digital Society, pp. 108-113. 2014.

CONFERENCE PRESENTATIONS

Risk-Sensitive Scenario-based Prediction of On-Site Demand and Completion Times in Modular Construction Projects

Talk presenting in IISE 2022 Conference, May 21st – May 24th , 2022, Seattle.

Parcel-logistic Customer Behavior Modeling and Scenario-based Demand Generation

Talk presenting in INFORMs 2020 Annual Meeting Conference, Nov 8th -11th, 2020.

Predictive Demand Modeling for New Services in Parcel-delivery Logistic Systems

Talk presenting in IISE 2020 Conference, Oct 31st – Nov 3rd, 2020, New Orleans.

An integrated parcel logistics demand and customer behavior modeling

Talk presenting in IISE 2019 Conference, May 21st, 2019, Florida.

Virtual Allocation Network Analysis: a fast way to Reliability-oriented Optimal Task Assignment in Heterogeneous Distributed Computing Systems

Poster presenting in CRIDC 2016 Conference, Georgia Tech, March 10, 2016.

Service Quality Ranking in Airborne Communication Networks

Poster presenting in ACM MobiHoc workshop on "Airborne Networks and Communications" 2014.

A Two-Dimensional Screening Method for Multi-Criteria reciprocal Selection Systems

Poster presenting in the third ASE International Conference on Social Informatics– Harvard University, Dec 2014.

TEACHING ASSISTANTSHIPS

ISYE - 6230 • Economic Decision Analysis
Georgia Tech, Spring 2022

CS - 4400 • Introduction to Database Systems
Georgia Tech, Summer 2021

ISYE- 6740 • Computational Data Analysis
Georgia Tech, Spring 2021

ISYE-6202 • Warehousing Systems
Georgia Tech, Fall 2017

ISYE-3104 • Supply Chain Modeling: Manufacturing & warehousing
Georgia Tech, Summer 2017

ISYE-3025 • Engineering Economy
Georgia Tech, Spring 2017

ISYE-4803 • Health Supply Engineering
Georgia Tech, Summer 2016