

# 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



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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.

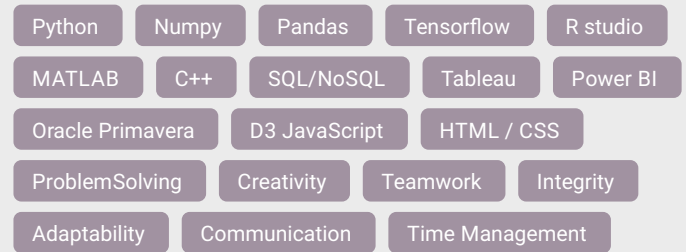
2017 - 2020

Atlanta, USA

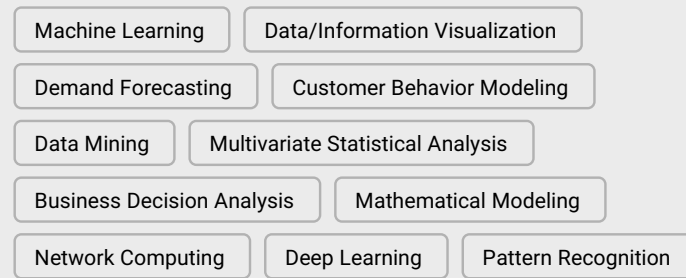
#### Achievements/Tasks

- 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** on **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



## INTERESTS



## 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