SAJJAD AMROLLAHI BIYOUKI

Data Scientist/Research Scientist in Machine Learning

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Department of Industrial and Systems Engineering, 851 Neyland Drive • Knoxville, TN

EXPERIENCE

Quantitative Researcher Intern
Wells Fargo

Jun 2022 – August 2022   Charlotte, NC

Risk Analytics & Decision Science - Wealth & Investment Management

- Developed and applied unsupervised machine learning algorithms to score the risks and detect high-risk branches within a high-dimensional risk-based dataset.
- Provided analytical insights of the outcomes to control and mitigate the risk of branches.

Graduate Research Assistant in Machine Learning
The University of Tennessee

Jan 2019 – December 2023   Knoxville, TN

- **Computer Vision & Pattern Recognition**
  - **Blind image deblurring for remote sensing images**
    Developed an adaptive data-driven kernel for blind image deblurring. It explicitly formulates the structure of the underlying kernel where the structure itself is adaptive to data, which enables modeling nearly non-parametric shape of blurriness. The proposed structure outperforms the recent ones when applied to the satellite images.
- **Operations Research**
  - **Robust simulation optimization for supply chain problem**
    Designed a neural network-based metamodel to optimize the uncertainty supply chain problem in a robust manner. The novel experimental design restricts solution space while maintains the essential supply control parameters and has less computational cost. The proposed approach can be implemented in commercial software for real-time decision-making strategies.
- **Deep & Reinforcement Learning**
  - **Deep Reinforcement learning for a scheduling problem**
    Developed a Deep Reinforcement Learning (Deep Q-learning) to schedule the tasks of distributed systems. This method improves the load of tasks and machines and has the capability to learn the agent to schedule a handful of tasks for multiple systems.
  - **Stacked LSTM Autoencoders for Day-ahead Precipitation Prediction**

Graduate Teaching Assistant - Statistics & Data Science
The University of Tennessee

Jan 2019 – December 2023   Knoxville, TN

- **Applied Data Science** (Graduate Course - IE 565)   Spring 2021
  - Mentored students to proceed their real data mining, image processing, and NLP projects.
  - Conducted office hours for students to teach python programming and solved their issues.
  - Graded and left feedback on their projects reports.
- **Engineering Statistics** (Undergraduate Course - IE 200)   Fall 2021
- **Design of Experiments** (Undergraduate Course - IE 340)   Fall 2020

EDUCATION

PhD in Industrial and Systems Engineering, Minor in Computer Science
Tickle College of Engineering, The University of Tennessee, Knoxville

Jan 2019 – December 2023

MSc in Statistics and Data Science
Haslam College of Business, The University of Tennessee, Knoxville

Jan 2019 – December 2023

MSc in Industrial Engineering and Management Systems
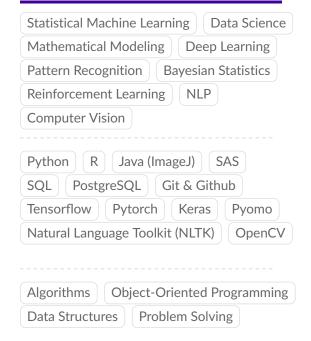**Amirkabir University of Technology (Tehran Polytechnic)**

Sept 2014 – October 2016

BSc in Industrial Engineering and Management Systems
Amirkabir University of Technology (Tehran Polytechnic)

Sept 2010 – August 2014

SKILLS

Statistical Machine Learning   Data Science   Mathematical Modeling   Deep Learning   Pattern Recognition   Bayesian Statistics   Reinforcement Learning   NLP   Computer Vision

Python   R   Java (ImageJ)   SAS   SQL   PostgreSQL   Git & Github   Tensorflow   Pytorch   Keras   Pyomo   Natural Language Toolkit (NLTK)   OpenCV

Algorithms   Object-Oriented Programming   Data Structures   Problem Solving

Data Scientist

Management Systems Co.

📅 Jan 2017 – Dec 2018

- Data Extraction and Data Wrangling using SQL.
- Developed machine learning models to predict and track the customers' loyalty.
- Analyzed the customer's business and data to identify their needs.
- Developed the customized Dynamics CRM system based on requirements.
- Developed integrated customer portals using HTML,CSS.

Research Assistant in Computational Intelligence Lab

Amirkabir University of Technology (Tehran Polytechnic)

📅 Sep 2014 – Oct 2016

- **A data-driven healthcare system**
  - Developed a data-driven system for thyroid function diagnosis and nodule detection based on thyroid images (Radioisotope) using unsupervised image segmentation and machine learning techniques in Python.
  - Developed an enhanced unsupervised fuzzy clustering algorithm for image segmentation Python.
  - Developed a rule-based decision support system for thyroid lab test data.

PUBLICATIONS

📄 Journal Articles

- Biyouki, S. A., & Hwangbo, H. (2021a). A comprehensive survey on deep neural image deblurring. *Working Paper*.
- Biyouki, S. A., & Hwangbo, H. (2021c). Blind image deblurring based on kernel mixture. *arXiv preprint arXiv:2101.06241 (Submitted to IEEE Transactions on Image Processing)*.
- Biyouki, S. A., & Zarandi, M. F. (2021). Data-driven fuzzy modeling for thyroid function diagnosis and nodule detection based on radioisotope images. *Revised to re-submit*.
- Sharifnia, S. M. E., Biyouki, S. A., Sawhney, R., & Hwangbo, H. (2021). Robust simulation optimization for supply chain problem under uncertainty via neural network metamodeling. *Computers & Industrial Engineering*, 107693.

👥 Conference Proceedings

- Biyouki, S. A., Ufodike, C., Li, X., & Bell, J. (2022). A simulation optimization model for urban-based distribution via a metaheuristic approach. In *Submitted to winter simulation conference 2022*.
- Biyouki, S. A., & Hwangbo, H. (2021b). An adaptive data-driven kernel for blind image deblurring. In *Informs annual meeting*. INFORMS.
- Pourkhalili, O., Sawhney, R., Biyouki, S. A., & Parsian, H. (2021). Utility scale battery as capacity source for electric grid systems. In *2021 ieee 9th international conference on smart energy grid engineering (sege)* (pp. 32–35). IEEE.
- Biyouki, S. A., Turksen, I., & Zarandi, M. F. (2015). Fuzzy rule-based expert system for diagnosis of thyroid disease. In *2015 ieee conference on computational intelligence in bioinformatics and computational biology (cibcb)* (pp. 1–7). IEEE.

SELECTIVE COURSEWORKS

- **Computer Science & Electrical Engineering**: Reinforcement Learning, Deep Learning, Digital Image Processing, Machine Learning, Artificial Intelligence and Expert Systems
- **Statistics & Data Science**: Bayesian Statistics (Theory & Applications), Data Mining, Categorical Data Analysis, Probability and Mathematical Statistics, Database and Big Data Technologies (Data Engineering), Systems Optimization
- **Industrial & System Engineering**: Stochastic Processes, Heuristics in Optimization (Algorithms), Advanced Optimization via Simulation, Mathematical Programming, Fuzzy Sets in Decision Making and Planning
- **Online Courses:** Probabilistic Graphical Models (Representation, Inference, Learning) - Standford University, Natural Language Processing - DeepLearning.ai

HONORS AND AWARDS

- Ranked 2nd in GPA among graduate peers in Eco-social Systems Engineering in Tehran Polytechnic, 2016.
- Admitted to Amirkabir University of Technology, Tehran Polytechnic (Second top university in Iran), 2010; 2014.

ORGANIZATIONAL

Founding President

INFORMS (Institute of Operations Research and the Management Sciences) Student Chapter - University of Tennessee, Knoxville

📅 Sep 2021 to date

President

ISA (Iranian Student Association) - University of Tennessee, Knoxville

📅 2020 – 2021

Membership

IEEE, INFORMS, IISE

📅 2020 to date