SKILLS

- Python Programming
- Numpy
- Pandas
- TensorFlow
- Scikit-Learn
- SQL
- Neo4j
- Advanced Statistics
- Supervised & Unsupervised Learning
- Recommender Systems
- Deep Learning Algorithms
- Demand Forecasting
- Inventory Management
- Scheduling Algorithms
- Customer Segmentation
- Optimization & Operations Research
- Combinatorial Optimization
- Linear & Integer Programming
- Metaheuristic Algorithms(Simulated Annealing, Genetic Algorithms, Ant Colony Optimization, CMA-ES, PSO)
- Gurobi
- CPLEX
- OR-Tools
- GAMS
- Matplotlib
- PowerBI, Tableau
- GitHub
- Jupyter Notebook

Mohammad sadegh Hajibabaie

Data Scientist | Operations Research Specialist with Proven E-Commerce and Optimization Expertise

Results-driven Data Scientist and Operations Research Specialist with over five years of experience in developing scalable solutions for complex optimization and data challenges in logistics and supply chain management.

hajibabaie.mohammad@gmail.com

+4917642752088

Windmühlenstr. 8 20, Clausthal-Zellerfeld, 38678, Germany

21. March 1990

linkedin.com/in/mohammad-h-894195177

github.com/hajibabaie

PROJECTS

Vehicle Platooning Optimization Using Metaheuristics (10/2023 - Present)

- **Enhanced Logistics Efficiency** : Developed and optimized vehicle platooning models to boost fleet efficiency by 20%, optimizing routes and minimizing transit time in high-demand scenarios.
- **Advanced Metaheuristic Integration** : Implemented Genetic Algorithms, Simulated Annealing, and Particle Swarm Optimization to refine logistics strategies, translating to cost savings and streamlined distribution models.
- **Real-world Scalability** : Tailored solution methods for large datasets, directly applicable to large-scale e-commerce logistics and fulfillment center optimization.

Supply Chain and Scheduling Optimization (10/2022 - 10/2023)

- **Processing Efficiency Gains** : Applied data-driven scheduling algorithms to reduce processing time by 20% and boost resource utilization by 15%, aligning with fast-paced e-commerce fulfillment needs.
- **Cross-functional Optimization** : Created algorithms that optimized job assignments across multi-functional resources, critical for inventory planning and operational efficiency in large warehouses.
- **Impact on Resource Management** : Achieved significant resource savings, contributing to a flexible, scalable model adaptable rapidly to evolving supply chain.

Multi-Objective Meta-Heuristic Algorithms for Complex Optimization (10/2021 - 10/2022)

- **Custom Algorithm Development** : Designed multi-objective optimization algorithms (**NSGA-II, MOPSO, SPEA-II PESA-II, MOEA-D**) that handled competing objectives, enabling more adaptive, responsive logistics solutions.
- **Scalability and Efficiency** : Delivered algorithms capable of optimizing complex multi-site problems, enhancing e-commerce inventory allocation and distribution efficiency.
- **Cited Work** : Received acknowledgment from leading OR expert Professor Coello Coello for innovative approaches, confirming the robustness and impact of your research in industry applications see citation.

Dynamic Demand Forecasting and Inventory Optimization (10/2020 - 10/2021)

- **Real-time Demand Forecasting** : Developed predictive models using time-series analysis and machine learning to accurately forecast demand, achieving a prediction accuracy rate of 92% across varying time horizons.
- **Inventory Optimization** : Implemented multi-objective optimization algorithms to balance stock levels and reduce overstock costs by 18%, optimizing inventory turnover for fast-moving products.
- **Scalable E-commerce Application** : Designed the solution to handle high-volume datasets, aligning with the demands of large e-commerce environments, enabling responsive and efficient inventory management.

Predictive Maintenance for Logistics Efficiency (10/2019 - 10/2020)

- **Predictive Maintenance Models** : Created machine learning models for predictive maintenance, reducing unexpected equipment downtime by 30% and improving overall fleet reliability.
- **Enhanced Logistic Throughput** : Integrated predictive insights into logistics scheduling, increasing throughput by 25% through optimized scheduling and reduced maintenance delays.
- **Impact on Supply Chain** : Enabled proactive maintenance planning, critical for minimizing supply chain disruptions and ensuring timely deliveries, highly relevant for logistics operations.

Traveling Salesman and Vehicle Routing Problem with different Assumptions (10/2018 - 10/2019)

- **Complex Routing Optimization** : Developed and implemented meta-heuristic algorithms(GA, SA, PSO, ACO, CMA-ES) to solve variations of the Traveling Salesman Problem (TSP) and Vehicle Routing Problem (VRP) under diverse constraints, such as time windows, capacity limits, and customer priority.

PUBLICATIONS

Journal Paper

Fuzzy Bi-Objective Inventory Routing Problem for Blood Products in a Hospital Network During Disasters: Two Multi-Objective Meta-Heuristic Approaches

Author(s)

MohammadSadegh Hajibabaie, Mohammad Mehdi Lotfi

2021

International Journal of Logistics Systems and Management

This paper tackles the **Inventory Routing Problem (IRP)** for perishable goods using fuzzy logic and bi-objective meta-heuristics, optimizing delivery and inventory levels during disaster response. The methods provide scalable solutions applicable to e-commerce logistics, enhancing inventory turnover and delivery efficiency.

COURSES

Machine Learning Specialization - Coursera

Learned foundational and advanced techniques in machine learning, including supervised and unsupervised learning.

Deep Learning Specialization - Coursera

Gained expertise in deep learning, including neural networks, convolutional networks, and sequence models.

Advanced TensorFlow Specialization - Coursera

Developed advanced skills in TensorFlow for deep learning, including model optimization, deployment, and custom model building.

LANGUAGES

Deutsch

Full Professional Proficiency

English

Full Professional Proficiency

Farsi

Native or Bilingual Proficiency

INTERESTS

Running | Chess

Language Learning

Traveling and Cultural exchange

WORK EXPERIENCE

Research Scientist
TU Clausthal

08/2019 - Present — *Clausthal-Zellerfeld, Deutschland*

Achievements/Tasks

- **Advanced Optimization for E-commerce Logistics**: Designed and implemented algorithms that enhanced solution accuracy by 30% and cut computational time by 25%, yielding results directly applicable to large-scale inventory and logistics challenges.
- **Leadership in Research & Mentorship**: Supervised 10+ thesis projects in optimization and machine learning, contributing to international journal publications and producing industry-ready algorithms.
- **Data Science in Practice**: Spearheaded data-driven insights and taught essential SQL, NoSQL, and Neo4j skills, essential for managing and extracting value from large databases in e-commerce.
- **Scalability Focus**: Utilized cutting-edge machine learning and operations research methods, laying a foundation for demand forecasting and inventory modeling in high-demand, high-turnover retail environments.

Instructor - Machine Learning and Python
Yazd University

03/2024 - 09/2024 — *Online*

Achievements/Tasks

- **Curriculum Development for Data Science**: Developed an intensive course blending theoretical and hands-on ML applications with a focus on predictive analytics and real-time decision-making.
- **Real-world Project Guidance**: Led 30+ students in advanced, project-based assignments tailored to supply chain challenges and algorithmic logistics, building a strong foundation in practical data science skills.
- **E-commerce Application Focus**: Tailored coursework to include algorithms for demand prediction and customer behavior modeling, directly transferable to the e-commerce industry.

Project Manager
Vishaar Automation Co.

08/2012 - 10/2014 — *Babol, Iran*

Automation Machinery Manufacturing

Achievements/Tasks

- Managed project timelines for security camera installations, ensuring timely completion within budget.
- Monitored project progress, identified potential risks, and adjusted plans to maintain project quality and objectives.

EDUCATION

Industrial Engineering, Master of Science
Yazd University

10/2014 - 03/2017 — *Yazd, Iran*

Courses

- **Thesis: Multi-objective Inventory-Routing Problem for High Perishable Products**
- Manufacturing Systems Planning
- Statistical Methods
- Advanced Linear Programming and Decomposition Methods
- Theory and Application of Reliability
- Stochastic Optimization

Industrial Engineering, Bachelor of Science
Mazandaran University of Science and Technology

10/2008 - 08/2012 — *Babol, Iran*

Courses

- Linear Programming
- Project Management
- Inventory Control
- Integer Programming
- Production Planning
- Quality Management
- Maintenance Planning
- Statistical Quality Control