

Danial Ramezani

Contact Information

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Research Interests

- Operations Research
 - Optimization
 - Heuristics/Meta-heuristics
 - Supply Chain and Logistics
 - Finance
 - Healthcare
 - Explainable AI
 - Data Mining and Machine Learning
 - Generative AI
 - Deep Learning
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Education

- **Kharazmi University** **Iran-Tehran**
M.Sc Industrial engineering – System engineering **2022-2024**
 - ❖ **Thesis:** It is composed of two research projects: 1. Fast-converging and extensive search strategies for evolutionary algorithms in large-scale portfolio optimization under cardinality constraint. 2. A novel robust mixed integer linear programming model for index tracking problem under no rebalancing: Heuristic optimization approach.
 - ❖ **GPA:** (18.91/20) – (4/4)
 - **Iran University of Science and Technology** **Iran-Tehran**
B.Sc Industrial engineering **2016-2021**
 - ❖ **Thesis:** A new user-friendly decision-making website for multi-criteria decision-making for experts and regular users
 - ❖ **GPA:** (15.97/20) – (3.28/4) Last two years: (17.41) – (3.651/4)
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Publications

- ❖ **Research Papers**
 - ❖ **Ramezani Danial.**; Abouei Ardakan Mostafa., “Fast-converging and extensive search strategies for evolutionary algorithms in large-scale portfolio optimization under cardinality constraint “, *Applied soft computing* – Under Review,
In this paper, strengthening strategies are presented for multi-objective evolutionary algorithms that can provide a faster convergence rate and extensive search ability in portfolio optimization problem under cardinality constraint. To implement those features, a unique solution representation, a novel operator, and new repair mechanisms

are introduced for solving the aforementioned problem in which lower and upper limits are set on the number of assets in the portfolio. For this purpose, new mating strategies along with the aforesaid package are implemented on a multi-objective evolutionary algorithm (NSGA-II) to solve the problem. The customized algorithm is subsequently tested against traditional NSGA-II using well-known market indices in the benchmark. Results indicate that the proposed strategy not only provides better approximations for identical numbers of iterations but converges faster as well at no loss of performance with increasing number of assets in the market.

- ❖ **Ramezani Danial.**; Abouei Ardakan Mostafa.; Mohammadreza Dehghani Ahmadabad,” A novel robust mixed integer linear programming model for index tracking problem under no rebalancing: Heuristic optimization approach”, *Annals of Operations Research – Under Review*.

In this paper, a new robust mixed integer linear programming model is that performs better in out-of-sample data compared to state-of-the-art formulations is proposed for index tracking problem. Furthermore, due to NP-hardness of the problem a new heuristic algorithm is developed to solve the proposed formulation that is capable of converging to the global optima in small size and outperforms commercial solvers in larger size in less computation time.

Academic Projects

- ❖ **Master’s Thesis**, In the first part of my thesis a novel fast-converging approach is implemented on Non-Dominated Sorting Genetic Algorithm (NSGA-II) for portfolio optimization problem that is able to approximate better results compare to regular NSGA-II in shorter time (Implemented in python). In the second part, a novel robust mixed integer programming model along with new heuristic are proposed that can achieve lower tracking error in out-of-sample compare to state of the art formulations. Master’s Thesis, Dr. Abouei Ardakan Mostafa, Mohammadreza Dehghani Ahmadabad 2024
- ❖ **Survey of application of Blockchain technology in agri-food supply chain**, The aim of the study was to determine the current state of the adoption of Blockchain technology in agri-food supply-chain and examining the opportunities and challenges of the aforesaid technology in supply chain by reviewing recent peer-reviewed papers, Project of the Course “Supply chain and logistics”, Dr. A. H. Gholam Saryazdi, 2023
- ❖ **Application of clustering in multi-objective Pareto Fronts**, I analyzed clustering of solutions found in Pareto Fronts in multi-objective algorithms (I coded a NSGA-II algorithm for mean-variance portfolio optimization) by Using clustering algorithms (such as K-means, Fuzzy C-means) (Implemented in python), Project of the Course “Data mining, applications and algorithms”, Dr. M. V. Sebt, 2023
- ❖ **Coding and analyzing the optimization model of vehicle routing problem with drones and time windows**, Purpose of the project was to code the mathematical model of paper “Vehicle routing problems with drones considering time windows” with GAMS and analyzing the model for improvement and mistakes, Project of the Course “Integer programming”, Dr. A. Mozdgir, 2023

- ❖ **Solving reliability optimization problem with water cycle algorithm and simulated annealing**, I Coded water cycle algorithm and simulated annealing algorithm in python for solving reliability optimization problem, Project of the Course “combinatorial optimization”, Dr. M. Abouei, 2022
- ❖ **Review of mining queuing system in Bitcoin’s Blockchain**, Analyzing queuing system in Bitcoin’s Blockchain, Project of the Course” Queueing theory”, Dr. A. Mirzazadeh, 2022
- ❖ **A new user-friendly decision-making website for experts and regular users**, A new user-friendly website for multi-criteria decision making methods (SAW-TOPSIS-ARAS-WASPAS-VIKOR) with different setting for usage of academic users and regular users currently deployed at “[de-decision](#)”, (Implemented in React JS Javascript), Bachelor’s Thesis, Dr. A. Makui, 2021
- ❖ **Designing the industrial unit for the production of jet fan tunnel**, Aim of the project was to plan a factory that will produce fans for tunnels from scratch, Project of the course “Planning industrial units”, Dr. M. S. Jabalameli, 2020
- ❖ **Investigating the effects of inappropriate use of cellphone on human body**, Goal of the study was to review the effect of usage of mobile phones on eyes, neck, etc. by reviewing recent published peer-reviewed journals, Project of the Course” Ergonomics”, Dr. R. ghousi, 2020
- ❖ **Comparison of Business Process Management Software(BPMS)**, Purpose of the project was to compare most common BPMS, Project of the Course “System analysis”, Dr. M. S. Pishvae , 2020
- ❖ **Study of Iran’s economy**, I studied Iran’s economy from GDP growth, infrastructures, inflation, population crisis and challenges by reviewing publicly available data published by Iranian government from, Project of the Course “Macroeconomics”, Dr. S. Mirzamohammadi, 2019

Self-Motivated projects and Researches

- ❖ **Investigating the impact of factors on training process in neural networks**, A project for analyzing the effects of the parameters, initialization, and optimization approaches on Neural Network training process on MNIST dataset in Tensorflow library, ongoing project
- ❖ **Artificial Neural network for trading using technical analysis in crypto market**, An artificial neural network is used to predict the direction of a possible trade. Features of this dataset are technical analysis attributes of 60,000 records of large-cap cryptocurrencies.
- ❖ **Application of Autoencoders in image processing**, Investigating how different autoencoders (denoising, compressing, generating, convolution) can be used for handwritten digit recognition using the MNIST dataset, Tensorflow ,2024
- ❖ **Framework for statistical arbitrage**, A framework for trading cointegrated pairs in crypto market using different time-series and machine learning models (Implemented in python),2024
- ❖ **Optimization model for pairs trading**, A mathematical formulation for finding cointegrated pairs with different size of Long-short portfolios alongside with their optimal weight,2024
- ❖ **Application of reinforcement learning in trading**, Reinforcement learning model for trading in cryptocurrency market using Tensorflow and Open AI gym libraries, 2024
- ❖ **A machine learning framework for technical trading**, A Random Forest model is implemented on customized data (using technical indicators alongside pattern recognition and economic indicators for features and custom target values) to predict whether long or short trade will be successful or not. (Average score of 75%), 2024
- ❖ **Optimization model for football fantasy**, An optimization model to find best players to be in starting eleven constrained to budget, formation, etc. that are expected to achieve maximum points (Implemented in python using Pyomo package), 2023

- ❖ **Market price prediction**, Price of the next period of the asset is predicted using the last two months data with LSTM, (Implemented in python using Tensorflow library), 2022
- ❖ **Ranking web developing programming languages with MADM methods**, Aim was to determine the best programming languages for new learners in web developing industry based on some criteria, 2021

Related Professional Experiences

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| <ul style="list-style-type: none"> ❖ Research Assistant <ul style="list-style-type: none"> ❖ Assistant to Dr. M. Abouei researching optimization problems in financial markets, and serving as a co-referee for academic papers ❖ Teaching Assistant – Simulation and modeling <ul style="list-style-type: none"> ❖ Assistant to Dr. H. Izadbakhsh in simulation and modeling course for a semester; coding examples, teaching python and organizing projects. ❖ Github repository related to the course: deDg0d/Simulation-via-python (github.com) ❖ Quality control engineer– Intern <ul style="list-style-type: none"> ❖ Three months work as a quality control engineer at the ZAM-ZAM corporates under supervision of Naghi Hosseinzadeh | <p>Iran-Tehran
2022-Present</p> <p>Iran-Tehran
2023</p> <p>Iran-Rasht
2021</p> |
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Skills

- ❖ **Programming Skills**
Python, GAMS, JavaScript
- ❖ **Software and Libraries**
Pyomo(Optimization), Tensorflow, Pytorch, Scikit-learn(Machine learning, Deep Learning and data mining), LaTeX, Microsoft Office, Weka, Minitab, Bizagi, Adobe Photoshop, ReactJS(Front-end web developing)
- ❖ **Other skills**
Academic Writing, Time-series Forecasting, Developing Heuristics, Statistical Arbitrage, Feature Engineering, Analyzing stock (Fundamental, Technical), Problem Solving

Related Certificates

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| <ul style="list-style-type: none"> ❖ Game Theory-Stanford University | <p>2022</p> |
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Relevant Coursework

Graduate courses:

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| ❖ Combinatorial Optimization | ❖ Stochastic Processes | ❖ Integer Programming |
| ❖ Queue Theory | ❖ Supply Chain and Logistics | ❖ Data Mining: Applications and Algorithms |
| ❖ Scheduling: Production Processes | ❖ Experiment Design | |

Undergraduate courses:

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| ❖ Engineering Economics | ❖ Microeconomics | ❖ Macroeconomics |
| ❖ Linear Algebra | ❖ Operations Research 1 | ❖ Probability Theory |
| ❖ Statistics | ❖ Operations Research 2 | ❖ Accounting and Finance |
| ❖ Statistical Quality Control | ❖ Financial Engineering | ❖ Inventory Control |
| ❖ System Analysis | ❖ Mathematical Decision-Making | ❖ Reliability and Maintenance |
| ❖ Simulation | ❖ Production Planning | ❖ Planning Industrial Units |
| ❖ Ergonomics | ❖ Management of Information systems | ❖ Marketing and entrepreneurship |
| ❖ Project Management | ❖ Management | ❖ Work Study |

References Are Available upon Request.