

Profile: Control and optimization researcher with a strong foundation in optimal control, systems theory, multi-objective and distributed optimization. My academic path has progressed from modeling and analyzing power-system dynamics in MATLAB to solving real-world non-convex optimization problems using Python and computational-intelligence methods. This work has strengthened my experience in metaheuristics, data-driven modeling, machine learning, uncertainty-aware decision-making, and scientific computing. My research spans intelligent power and energy systems, microgrids, industrial automation, and digital health, with particular interest in combining optimization, control, and AI for reliable, efficient, and sustainable engineered systems. Looking ahead, I aim to develop scalable, data-driven, and resource-aware methods for complex cyber-physical and biomedical applications.

Research Interest

Optimization & Control	Multi-objective optimization; Metaheuristics; Distributed optimization; Optimal control; Consensus & Multi-agent systems; Game-Theoretic Decision-Making; Reliable & Sustainable Control.
Artificial Intelligence	Machine learning; Deep learning; Computational intelligence; Intelligent decision-making; Data-driven modeling & Analytics; Uncertainty modeling & Forecasting.
Power & Energy Systems	Power-system optimization; Smart grids & Microgrids; Electricity markets; Renewable energy integration; Energy management.
Digital Health	Wearable health monitoring; Biomedical signal processing; Biosensors & Medical Instrumentation; AI for Healthcare; Health Data Analytics for Detection and Prediction.

Education

M.Sc. in Electrical Engineering (Control Systems)

Oct 2021 – Jul 2024

Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran

- Final Rank:** 3rd out of 36 students in program; **GPA:** 3.88/4.00 (17.23/20).
- Thesis:** “Solving the Combined Economic–Emission Dispatch Problem under Realistic Conditions and Proposing an Optimization Algorithm.”
- Relevant Coursework:** Optimal Control Systems, System Identification, Neural Networks, Multivariable Control, Nonlinear Control, Fuzzy Control, Economy & Energy Management, Power System Utilization.

B.Sc. in Electrical Engineering (Power Systems)

Sep 2016 – Sep 2020

Imam Khomeini International University, Qazvin, Iran

- Final Rank:** Top 9% of 135 students in program; **GPA:** 3.15/4.00 (15.74/20).
- Thesis:** “Solving the Economic Load Dispatch Problem Using a Novel Approach.”
- Relevant Coursework:** Signals and Systems, Linear Control Systems, Electric Circuits I & II, Modern Control Systems, Fundamentals of Operations Research, Engineering Probability, Engineering Mathematics, Power System Analysis I & II.

Publications & Manuscripts

1)

Huriye Sadat Sadeghi, Mohsen Ahmadi, **Daniel Rajabi**. “Design and prototyping of an AI-powered wearable device for continuous vital signs monitoring with intelligent alerting.” Scientific Reports 15, 45178 (2025). Published Nov 2025. DOI: 10.1038/s41598-025-28772-2.

2)

Daniel Rajabi, HuriyeSadat Sadeghi, Mohammad Bagher Menhaj, Amir Abolfazl Suratgar, Seyedali Mirjalili. “Olympic Champion Algorithm (OCA): A new human-inspired metaheuristic algorithm for solving optimization problems.” Under review at the International Journal of Artificial Intelligence and Soft Computing (2026). Preprint DOI: 10.21203/rs.3.rs-7388693/v1.

3)

Daniel Rajabi, AmirAbolfazl Suratgar, Mohammad Bagher Menhaj, Babak Safaei. “Data-Driven Multi-Objective Optimization for Dynamic Combined Economic Emission Dispatch (CEED): Application of the OCA and Benchmarking of Metaheuristic Algorithms.” Submitted to Energy Reports (2026). Preprint DOI: 10.2139/ssrn.7324004.

4)

Daniel Rajabi, Mohammad Bagher Menhaj, Amir Abolfazl Suratgar. “Computational Intelligence–Driven Distributed Multi-Objective Energy Management for Sustainable Renewable-Rich Hybrid Microgrids under Uncertainty: Machine Learning-Based Forecasting, Energy Storage, and Dynamic Economic-Emission Dispatch.” Manuscript in preparation (2026).

5)

HuriyeSadat Sadeghi*, **Daniel Rajabi***, Mohsen Ahmadi. “Recent Advances in Wearable Technologies for Continuous Vital Sign Monitoring in Digital Health: Enabling Technologies, Artificial Intelligence, Clinical Translation, and Future Directions.” Review manuscript in preparation (2026).*These authors contributed equally to this work and share first authorship.

Funded Research Experience

From Research to Prototype | Interdisciplinary Development of an AI-Powered Wearable Vital-Sign Monitoring System | Digital Health | Research supported by Shahid Beheshti University of Medical Sciences
Grant No. 43010314. | [Link](#)

2024–2025

- **Theoretical & Data-Driven Research:** PPG-based cuffless BP/RR estimation, embedded AI, multi-vital-sign monitoring, and intelligent alerting.
- **Prototype Development:** Hardware integration, on-device implementation, system testing, and validation of a functional wearable prototype.
- **Research Outcome:** Peer-reviewed publication with continued development toward clinical validation and commercialization.

Research Contributor & Proposal Co-Author | Joint IIASA–INSF Postdoctoral Fellowship Project | International Institute for Applied Systems Analysis (IIASA) & Iran National Science Foundation (INSF) | Grant No. 40503825. | [Link](#)

2026–Present

- Contributed to the development of the research proposal and technical framework integrating machine learning, distributed optimization, and metaheuristic methods for sustainable power-grid operation.

Highlighted Research Projects

Research Assistant, Amirkabir University of Technology (AUT), Distributed and Intelligence Optimization Research Laboratory (DIOR), under the supervision of **Prof. Amir Abolfazl Suratgar**

2022–Present

- **Energy trading and markets, power distribution and management, resource allocation, and distributed optimization in microgrids** | [Link](#)
Developed distributed optimization frameworks for energy trading, market clearing, resource allocation, and resilient microgrid coordination under realistic operational and network constraints.
- **A Distributed Approach for Solving Multi-Objective Optimal Power Flow** | [Link](#)
Developed a distributed optimization approach for multi-objective optimal power flow, enabling coordinated decision-making across interconnected power-system components while handling conflicting objectives and operational constraints.

Research Assistant, Amirkabir University of Technology (AUT), Advanced Learning Systems Laboratory, under the supervision of **Prof. Mohammad B. Menhaj**

2023–Present

- **Development and Benchmarking of an OCA-Based Python Optimization Framework for Derivative-Free, Non-Convex, and Discrete Optimization**
Developed and benchmarked a Python-based implementation of the Olympic Champion Algorithm (OCA) for black-box, non-differentiable, non-convex, and constrained optimization, with support for binary and high-dimensional search spaces, and evaluated its convergence, robustness, and solution quality on data-driven and feature-selection problems as a gradient-free alternative for cases where conventional gradient-based optimization is difficult or unsuitable.

Selected Graduate Course Projects

2021–2024

- **Multi-Objective Optimization & Control for Microgrid P2P Energy Transactions:** Modeled producer–consumer–prosumer energy transactions using multi-objective optimization, OCA, optimal-control concepts, and Pareto-front analysis.
- **Scenario-Based Economic & Emission Dispatch with Metaheuristic Optimization:** Implemented and benchmarked SMA, GWO, PSO, WOA, and SA for multi-objective economic dispatch under environmental and operational constraints, analyzing cost–emission trade-offs across multiple scenarios.
- **Optimization in Electricity Markets:** Developed and analyzed optimization models in MATLAB for electricity-market operation, profitability, resource allocation, system constraints, and reliability.
- **CNN Hyperparameter Optimization for Sensor-Based Human Activity Recognition:** Applied metaheuristic optimizers, including GWO, WOA, and OCA, to tune CNN hyperparameters for sensor-based human activity recognition.
- **Machine Learning for Pediatric Length-of-Stay Prediction:** Applied Decision Tree, CNN, KNN, and SVM models to pediatric respiratory-disease data for hospital length-of-stay prediction and comparative model evaluation.

Teaching & Academic Service

Teaching Assistant — 4 Courses | Amirkabir University of Technology | Electrical Engineering 2022 – 2023

- Linear Control (Fall 2022)
- Optimal Control (Fall 2023)
- Electrical Circuits (Winter 2022)
- Fuzzy Control (Winter 2023).

Conference Reviewer — 3 Papers | ICROM 2024

- Reviewed three conference submissions related to control, optimization, automotive safety, vision-based precision landing, and robotic motion planning.

Industrial Experience

Building Management System (BMS) Engineer | Zist Takhmir Pharmaceutical Company | [Link](#) 2025 – Present

- Worked with large-scale sensor-based monitoring and control infrastructure, including BMS, SCADA, HVAC, and cleanroom automation, covering approximately 700 real-time operational parameters.
- Monitored and analyzed temperature, humidity, pressure, water, gas, electrical, steam, and utility-system variables, supporting fault detection, alarm management, data logging, and reliable system operation.
- Gained hands-on experience in industrial automation, real-time monitoring, systems integration, multidisciplinary engineering, leadership, and technical teamwork within a pharmaceutical manufacturing environment.

Control Engineer (Intern) | Shahid Rajaee Power Plant | Qazvin, Iran 2019

- Completed a three-month industrial internship in a large power-generation environment, gaining exposure to plant operations and electrical engineering practice.
- Collaborated closely with system operators to define precise defect criteria, translating practical needs into robust technical specifications.
- Validated system performance and accuracy through rigorous real-world testing, fine-tuning model parameters to meet industrial performance targets.

Technical Skills

Programming Languages: MATLAB; Python; C/C++

Scientific Computing & Machine Learning:

- Deep Learning:** PyTorch, TensorFlow
- Core Libraries:** scikit-learn, NumPy, SciPy, pandas
- Signal Processing:** Real-Time & Biomedical Signal Processing

Optimization & Control: Metaheuristics, Multi-Objective Optimization, Optimal Control, Distributed Optimization, Consensus & Multi-Agent Systems, GAMS

Modeling, Simulation Tools & Automation:

- System Modeling:** Simulink, Proteus, Fritzing, COMSOL Multiphysics
- Embedded Systems:** Arduino, Microcontrollers, AVR
- Industrial Automation:** PLC, Siemens TIA Portal, SCADA/BMS, HVAC

Documentation & Productivity: LaTeX, Microsoft Office Suite

Professional Competencies: Project Coordination, Technical Troubleshooting, Cross-Functional Collaboration, Leadership, Teamwork, Adaptability, Persistence, Independent Problem-Solving

Other Honors & Academic Distinctions

Admitted to Iran's 3rd-ranked university for M.Sc. study through the National Entrance Examination, with government-funded, tuition-free admission, after ranking in the top 0.07% among 145,564 candidates. 2021

Admitted to Iran's 9th-ranked university for B.Sc. study through the National Entrance Examination, with government-funded, tuition-free admission, after ranking in the top 0.12% among 761,273 candidates. 2016

Academic References

Prof. Mohammad B. Menhaj <i>M.Sc. Thesis Advisor</i> Professor, Electrical Engineering, AUT menhaj@aut.ac.ir +98 935 130 4513 Google Scholar	Prof. Amir Abolfazl Suratgar <i>M.Sc. Thesis Advisor, Senior Member, IEEE</i> Professor, Electrical Engineering, AUT a-suratgar@aut.ac.ir +98 912 835 5219 Google Scholar	Prof. Seyed Hossein Hosseinian <i>M.Sc. Thesis Referee & Course Professor</i> Professor, Electrical Engineering, AUT hosseinian@aut.ac.ir +98 21 6454 3343 Google Scholar
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