Farshid Bagheri Saravi

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Electrical, Computer, and Systems Engineering Department
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Case Western Reserve University
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Personal Website, **IEEE**, **Google Scholar**, **Scopus**, **Web of Science**, **ORCID**, **ResearchGate**, **LinkedIn**, **GitHub**

EDUCATION

2022–present
Doctor of Philosophy (expected May 2028)
Electrical, Computer, and Systems Engineering Department, Case Western Reserve University

2015–2018
Master of Science (Thesis Grade 9/10, Comparable A+), GPA 3.6
Department of Electrical and Computer Engineering, University College of Rouzbahan
Thesis: *Present a New Method for Energy Efficient Routing in Wireless Body Area Networks*
Supervisor: Dr. Mehdi G. Amiri

2009–2012
Bachelor of Science (Top Researcher in the University 2011 -2012 honors)
Department of Electrical and Computer Engineering, IAU
Thesis: *Reducing the Energy Consumption of the Entire Wireless Sensor Network by Providing a Reliable Communication Protocol*
Supervisor: Dr. Soheil Fateri

2006–2009
Associate of Science
Department of Electrical and Computer Engineering, IAU
Thesis: *Improving the Security in Wireless Sensor Networks to Detect and Prevent Attacks*
Supervisor: Najmeh Danesh

RESEARCH EXPERIENCE

2024-present
Research Assistant, Ph.D. Research Program
Center for Clinical Informatics Research and Education, MetroHealth
Project: Adaptive Machine Learning for Predicting Patient Census and Staffing Optimization
Supervisor: Prof. David C. Kaelber

2023-2024
Research Assistant, Ph.D. Research Program
Institute for Smart, Secure and Connected Systems (ISSACS), Case Western Reserve University
Project: Development and Implementation of a Custom Data Acquisition System (NICU)
Supervisors: Prof. Kenneth A. Loparo and Pan Li

2020-2022
Research Associate, CS-IT Research Program
Department of Computer Science and Information Technology, CS-IT HUB, Florida

Project: Researched and enhanced emerging healthcare technologies
Supervisors: Prof. Ehsan Sheybani and Giti Javidi

2018-2020
Research Assistant, CS-IT Research Program
Department of Computer Science and Information Technology, CS-IT HUB, Florida
Project: Conducted research in wireless communications and metaheuristic algorithms
Supervisors: Prof. Ehsan Sheybani and Giti Javidi

2018-2022
Senior Research Consulting Professional
Project: Led study team in project development, defined research objectives and strategies, and collaborated effectively with team members
Supervisors: Prof. Ehsan Sheybani

2016–2017
Research Assistant, Master's Level
Department of Electrical and Computer Engineering, University College of Rouzbahan
Project: Designed an Optimized Routing Protocol and Minimized Energy Consumption in WBANs
Supervisor: Dr. Mehdi G. Amiri

2013
Research Assistant, Wireless Sensor Network Laboratory
Project: Reviewed Several Security and Coverage Algorithms Studied in their Simulations
Supervisor: Mohammad Hossein Homaei

RESEARCH INTERESTS
- Machine Learning
- Optimization
- Data Analysis
- Neural Network Algorithms
- Predictive Modeling

SELECTED HONOURS AND AWARDS
2018 Highest grade of the master thesis (First Class), University College of Rouzbahan
2011-2012 Best researcher and Special Talent in IAU, and Young and Elite Researchers Club
2011 Best essayist on Third Scientific Student Festival in 3rd Region

PUBLICATIONS
Publication in refereed journals
- **F. B. Saravi**, G. Javidi and E. O. Sheybani, "Energy-Efficient Routing Protocols Leveraging Enhanced PSO for Optimizing Packet Delivery Rate in WBANs", Preprints, 2024.
- **F. B. Saravi**, E. O. Sheybani and G. Javidi, "AWDO: A Novel Swarm Intelligence Approach based on the Behavior of African Wild Dogs in Solving Optimization Problems", Preprints, 2024.
- **F. B. Saravi**, S. Moghanian, G. Javidi and E. O. Sheybani, "A Diagnosis Approach Using Apache Spark Architecture and Machine Learning in WBAN", Preprints, 2021. *Focused on healthcare data analysis leveraging machine learning to enhance diagnostic accuracy.*
- S. Moghanian, **F. B. Saravi**, G. Javidi and E. O. Sheybani, "GOAMLP: Network Intrusion Detection with Multilayer Perceptron and Grasshopper Optimization Algorithm," in *IEEE Access*, vol. 8, pp. 215202-215213, 2020, doi: 10.1109/ACCESS.2020.3040740. (Impact Factor: 4, H-Index: 86).
- M. H. Homaei, **F. B. Saravi**, B. Farhadi, "Application of Wireless Sensor Networks to Detect Water Leak and Drain in Transmission Lines," in *Journal of Informatics Society*, 2013, vol. 210, pp. 58-61.
- M. H. Homaei, B. Farhadi, H. Ranjbaran, **F. B. Saravi**, "Using Wireless Sensor Networks for Flood Detection in Smart Cities," in *Journal of Informatics Society*, 2012, vol. 206, pp. 54-57.

- M. H. Homaei, B. Farhadi, H. Ranjbaran, **F. B. Saravi**, “A Review and Analysis of Coverage Problem in Wireless Sensor Networks,” in *Journal of Informatics Society*, 2012, vol. 205, pp. 66-71.

Paper submitted for publication in refereed journals

- **F. B. Saravi**, G. Javidi and E. O. Sheybani, (2024, August). Energy-Efficient Routing Protocols Leveraging Enhanced PSO for Optimizing Packet Delivery Rate in WBANs., Submitted to *Journal of Network and Computer Applications*. IF: 5.6.
- **F. B. Saravi**, E. O. Sheybani and G. Javidi, (2024, August). AWDO: A Novel Swarm Intelligence Approach based on the Behavior of African Wild Dogs in Solving Optimization Problems., Submitted to *IEEE Systems Journal*. IF: 4.
- **F. B. Saravi**, S. Moghanian, G. Javidi and E. O. Sheybani, (2023, December). GBAT: An Improved BAT Algorithm Parallelization in CUDA Fusion with Genetic Algorithm., Submitted to *Elsevier Expert Systems with Applications*. IF: 5.5.

Publications in refereed conference proceedings

- M. H. Homaei, **F. B. Saravi**, F. Olianasab, M. Habibi, M. Amiri, F. Ebrahimi, “Maintaining WSNs Coverage and Connectivity Using Mobile Sensor Nodes in Clustering,” in *2015 International Conference on Information Technology, Computer & Communication (ITC)*, Torbat-e Heydarieh, Iran, 2015, pp. 78-92.
- **F. B. Saravi**, F. B. Saravi, A. Abbasi, “Using Fuzzy Logic and Genetic Algorithm in Wireless Sensor Networks,” in *2012 International Conference on Computer and Information Technology (CIT),* Kerman, Iran, 2012.
- **F. B. Saravi**, F. B. Saravi, “Enhance Security to Detect and Prevent the Intrusion of Anonymous Nodes in Wireless Sensor Networks,” in *2011 International Conference on Information and Communication Technology (ICT)*, Abhar, Iran, 2011.
- **F. B. Saravi**, F. B. Saravi, “Node Location Algorithm Based on Learning Automata in WSNs,” in *2011 International Conference on Information and Communication Technology (ICT)*, Abhar, Iran, 2011.

EDITORIAL AND REVIEWER EXPERIENCE

- Reviewer, **IEEE Internet of Things** (IoT), Q1, IF 10, H-Index: 119 (2020 – Present)
- Reviewer, **IEEE Access**, Q1, IF 4, H-Index: 158 (2020 – Present)
- Reviewer, **IEEE Systems Journal** (ISJ), Q1, IF 4, H-Index: 88 (2020 – Present)
- Reviewer, **Elsevier Expert Systems with Applications** (ESWA), Q1, IF 5.5, H-Index: 225 (2020 – Present)
- Reviewer, **Elsevier Information Sciences** (INS), Q1, IF 8.233, H-Index: 194 (2020 – Present)

TEACHING EXPERIENCE

Fall 2022 - Spring 2023

ECSE 351 Communications and Signal Analysis, Case Western Reserve University
Graduate Teaching Assistant: Prepared and conducted weekly tutorials for classes of 50 students as well as marking duties and office hours.

Spring 2018

Wireless Communication in Health Care (Wireless Body Area Networks), University College of Rouzbahan
Instructor: Designed an Optimized Routing Protocol and Minimized Energy Consumption

Winter 2017

Wireless Body Area Networks, University College of Rouzbahan
Instructor: Introduction of Wireless body area networks
- Prepared and conducted weekly tutorials for a class of 35 students as well as marking duties.

COURSE PROJECTS

2024

Ph.D. Student, Junior Machine Learning Engineer

Project: NICU Data Acquisition and Calibration System
Institute: Ph.D. Research Program, (ISSACS)

Led the development and implementation of a custom data acquisition system for neonatal intensive care units (NICU), focusing on vital signs such as heart rate and oxygen saturation. Involved in data collection, calibration of prototype devices, and applying machine learning algorithms to identify early signs of neonatal diseases.

Python, MATLAB, Custom Hardware Prototyping, Scikit-learn.

Enhanced the accuracy and reliability of patient monitoring systems, leading to better disease detection and management in neonates.

2024

Ph.D. Student, Junior Data Scientist

Project: Diabetes Prediction and Management System
Course: Data Science in Health and Healthcare (NURS 533)

Developed a comprehensive machine learning model using logistic regression and random forest classifiers to predict diabetes risk based on a large dataset of patient records, including age, BMI, blood pressure, and glucose levels. Conducted data preprocessing, feature engineering, and hyperparameter tuning to optimize model performance.

Pandas, Scikit-learn, TensorFlow

Achieved an accuracy of 85% and an AUC-ROC score of 0.89, enabling early diagnosis and personalized treatment planning for patients. Implemented a pilot study in collaboration with a local healthcare provider, leading to enhanced patient management and timely interventions.

2023-2024

Ph.D. Student, Junior Machine Learning Engineer

Project: Breast Cancer Detection
Course: Special Topics in AI (CSDS 600)

Implemented a deep learning algorithm using convolutional neural networks (CNNs) for breast cancer detection. The project involved preprocessing mammography images, applying data augmentation techniques, and training the CNN on a labeled dataset to classify images as benign or malignant.

Keras, TensorFlow, OpenCV

Improved diagnostic accuracy to 92% and reduced false positives by 15%. The model was validated with an independent test set, and results were presented in the class.

2023-2024

Ph.D. Student

Project: Lung Cancer Detection
Course: High-Performance Data & Computing in AI (CSDS 438)

Developed a radiomics-based machine learning pipeline to analyze CT scans for the early detection of lung cancer. The system included automated feature extraction, feature selection using recursive feature elimination, and classification using support vector machines (SVMs).

SimpleITK, Scikit-learn, Radiomics

Achieved a sensitivity of 88% and a specificity of 90%, aiding significantly in clinical decision-making.

2022-2023

Ph.D. Student

Project: Tumor Classification
Course: Machine Learning on Graphs (CSDS 600)

Developed a robust classification model using graph convolutional networks (GCNs) to distinguish between benign and malignant tumors from histopathological images. Involved in the preprocessing of images, constructing graph representations of tissue samples, and training the GCN model.

PyTorch, NumPy, Scikit-learn, NetworkX

Achieved an F1 score of 0.87, improving the efficiency and accuracy of tumor characterization.

2022-2023

Ph.D. Student

Project: Heart Disease Prediction Using Ensemble Learning

Course: Machine Learning and Data Mining (CSDS 435)

Developed an ensemble learning model combining random forest, gradient boosting, and neural networks to predict the risk of heart disease based on patient medical records. Emphasized on feature selection, model blending, and performance optimization.

Scikit-learn, XGBoost, TensorFlow

Achieved an accuracy of 90% and an AUC-ROC score of 0.92. The model provided reliable predictions for early intervention, reducing the incidence of heart disease complications.

OTHER SKILLS AND QUALIFICATIONS

- Career Essentials in GitHub Professional Certificate, GitHub, April 2024
- Google Data Analytics Professional Certificate, Google, Credly, March 2024
- Data Analysis with R Programming, Google, March 2024
- Structuring Machine Learning Projects, DeepLearning.AI, March 2024
- Data Science & Analytics, HP-Life, March 2024
- Python for Data Science, AI & Development, IBM, March 2024
- Linear Algebra for Machine Learning and Data Science, DeepLearning.AI, March 2024
- Design Thinking for Innovation, Coursera, expected Jun 2024
- Python Quick Start, LinkedIn Learning, February 2023
- Programming Foundations: Fundamentals, LinkedIn Learning, November 2022
- Blockchain, Crypto Mastery, Australian Universal Academy, December 2018
- Microsoft Certified Professional: Certification Number: E921-8322, April 2012
- MCTS: Windows Server 2008 Network Infrastructure, Configuration, Certification Number: D492-6472, September 2011
- Windows Server 2008 Network Infrastructure, Configuring
- Microsoft Certified Technology Specialist (MCTS), September 2011
- Windows 7 Client Configuring, (MCTS), September 2011
- Cisco Certified Network Associate, (CCNA Routing & Switching), 304h, Credential ID: 100008144, February 2011
- CompTIA Network+, 30h
- Computer Network General Technician, 240h, Credential ID: 121139, April 2010

MEMBERSHIPS

- **IEEE Student Member**, Active participation in events and seminars focused on data science and machine learning, 2017-present
- Young and Elite Researchers Club of Iran, Informatics Society of Iran, Computer Society of Iran, 2011-present
- WSN Laboratory, Hoorsan Ekbatan Knowledge Enterprise Co. (HEKE), 2011- 2013

LANGUAGES

Persian Native Language

Fluent in English (spoken and written): TOEFL PBT Test Score: 614 (670), Duolingo English Test Score: 135 (160)

Elementary skills in German (spoken and written): A2 Level

TECHNICAL SKILLS

- Programming Languages (C/C++, Python, R, MATLAB)
- Machine Learning/Deep Learning (TensorFlow, Keras, PyTorch)
- Data Analysis Tools (Pandas, NumPy, Scikit-learn, Tableau)
- Data Visualization (Matplotlib, Plotly, Seaborn, ggplot2)
- Software Development (Git, Docker, Jupyter)
- Systematic Review & Bibliography (EndNote, Mendeley, Zotero)

REFERENCES

- Prof. Ehsan Sheybani
  Information Systems and Data Science, University of South Florida, Sarasota Manatee

8350 N. Tamiami Trail, Sarasota, FL, 34243, USA,
Tel.: (941) 359-4387 ; (804) 520-0102 E-mail: sheybani@usf.edu
Relationship: Research cooperative

• Prof. Giti Javidi
Information Assurance and Cybersecurity Management, Muma College of Business, University of South Florida, USA,
Tel.: (941) 359-4257 E-mail: javidi@usf.edu
Relationship: Research cooperative

• Dr. Mohsen AmiriBesheli
Konica Minolta Laboratory Europe, 90 Chancery Lane, London WC2A 1EU, United Kingdom
Tel.: +44-7428-521592 ; +44 (0) 7841495718
E-mail: Mo@besheli.com; mohsen.amiribesheli@konicaminolta.co.uk
Relationship: Research cooperative, teaching reference

• Dr. Ali Mohammad Shahri
Faculty of Science & Technology, Department of Computing & Informatics, Bournemouth University, Fern Barrow, Poole, Dorset, BH12 5BB, United Kingdom
Tel.: +44-7851-420232 E-mail: ashahri@bournemouth.ac.uk
Relationship: Teaching reference

• Dr. Mehdi G. Amiri
Department of Electrical and Computer Engineering, IAU, IRAN
Tel.: +98-911-116-1192 E-mail: golesorkh@baboliau.ac.ir
Relationship: MSc. thesis supervisor, teaching reference