

Sajad Mousavi

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TECHNICAL SKILLS

- **Machine/Deep learning and Computer vision libraries:** TensorFlow, PyTorch, Lasagne/Theano, Caffe, Ray/RLlib, Scikit-learn, Weka, Google Colab, OpenCV.
- **Programming Languages:** Python, R, Java, C++, Matlab
- **Database Technologies:** Oracle, MS Access, MS SQL Server, MySQL, Oracle NoSQL.
- **Parallel programming:** Multiprocessing/multithreading in Python and C, MPI, OpenMP
- **Experience with:** Git, Docker, Azure DevOps Server, AWS, HPC
- **Operating Systems:** Linux, Windows.

EDUCATION & TRAINING

- **Harvard University** Boston, Massachusetts
Postdoctoral Researcher in Biomedical Informatics, Harvard Medical School May 2020 – May 2021
- **Northern Arizona University** Flagstaff, AZ
PhD in Informatics and Computing May 2020
- **Northern Arizona University** Flagstaff, AZ
Master of Science in Informatics Dec. 2018
- **National University of Ireland, Galway** Galway, Ireland
Master of Engineering in Information Technology Aug. 2017
 - **Thesis:** Researching Advanced Deep Learning Methodologies in Combination with Reinforcement Learning Techniques
- **Iran University of Science and Technology** Tehran, Iran
Master of Science in Artificial Intelligence and Robotics Sep. 2012
 - **Thesis:** Adjustable Autonomy Using Reinforcement Learning for Multi-Agent Systems
- **University of Zanjan** Zanjan, Iran
Bachelor of Software Engineering Sep. 2010
 - **Thesis:** Study and Using the MPI Library in Parallel Systems and Supercomputers

WORK AND RESEARCH EXPERIENCES

- **Hewlett Packard Enterprise (HPE)** Milpitas, CA, USA.
Research Scientist Sep. 2021 - Present
 - **Machine Learning and Reinforcement Learning:** Developing automatic tools to assess trained machine learning models
- **Tiposi** Milpitas, CA, USA.
Senior AI Engineer June 2021 - Aug. 2021
 - **Machine Learning:** Building machine learning pipeline and AI platform for image reconstruction from microwave signals
- **UC San Diego Health, Dept. of Biomedical Informatics** San Diego, CA, USA.
Bioinformatics Programmer II June 2019 - Aug. 2019
 - **Time series analysis and Machine learning:** Worked on the design and development of machine learning models for early prediction of life-threatening conditions such as Sepsis and Delirium using electronic health record (EHR) data.
 - **Supervisor:** Prof. Shamim Nemati
- **FotoNation (Xperi Corporation)** Galway, Ireland
Intern May 2016 - Sep.2016; May 2017 - Aug. 2017

- **Machine learning:** Worked in deep learning, reinforcement learning, and computer vision fields to design and develop algorithms for object detection, face detection/recognition.
- **Supervisor:** Pawel Filipczuk and Gabriel Costache
- **National University of Ireland, Galway** Galway, Ireland
Research and Teaching Assistant *Oct. 2015 - Aug. 2017*
 - **Research Assistant:** Research on machine learning and deep learning for traffic light control & playing games in interactive environments.
 - **Teaching Assistant:** Object Oriented Programming: Data Structures and Algorithms; Computing Architecture & Operating Systems; Next Generation Technologies II; Java Programming.
- **Karoon Higher Education Institute** Ahvaz, Iran
Faculty Member *Jan. 2014 - Sep. 2015*
 - **Instructor:** Artificial Intelligence; Data Structures and Algorithms; Database Systems; Expert Systems; C++ Programming.
- **Iran University of Science and Technology** Tehran, Iran
Software Developer *Sep. 2011 - May 2012*
 - **Database Management:** Oracle NoSQL & Neo4j NoSQL implementation on Linux servers with Java programming language.
- **University of Zanjan** Zanjan, Iran
Software Developer *Jan. 2009 - Aug. 2010*
 - **Parallel Programming:** Study and writing parallel programs for multi-processor computers using MPI and TBB libraries.

GRADUATE COURSES

- Statistical Pattern Recognition
- Machine Learning
- Artificial Neural Networks
- Statistical Image Processing
- Digital Signal Processing
- Multi-agent Systems
- Evolutionary Computing
- Remote Sensing
- Statistical Methods
- Large-scale Data Structures and Organization
- Topics in Cybersecurity
- High Performance Computing
- Research Methods in Informatics and Computing

PATENTS AND INVENTION DISCLOSURES

- **F. Afghah, S. Mousavi, "ECG Language Processing (ELP) for Detection and Prediction of Cardiac Events", Patent Pending, App. No.: 17343499, Jun. 2021.**
- **F. Afghah, S. Mousavi, "Patient ECG Heartbeat Classification for Arrhythmia and Atrial Fibrillation Detection", Patent Pending, App. No.: 62801881, Jan. 2019.**

1. Feroe, A.G., Uppal, N., Gutiérrez-Sacristán, A., **Mousavi, S.**, Greenspun, P., Surati, R., Kohane, I.S. and Avillach, P., (2021). Medication Use in the Management of Comorbidities Among Individuals With Autism Spectrum Disorder From a Large Nationwide Insurance Database. **JAMA pediatrics**.
2. **Mousavi, S.**, Afghah, F., Khadem, F. and Acharya, U.R., (2021). ECG language processing (ELP): a new technique to analyze ecg signals. *Computer Methods and Programs in Biomedicine*, p.105959.
3. Belen, J., **Mousavi, S.**, Shamsoshoara, A., and Afghah, F. (2020). An Uncertainty Estimation Framework for Risk Assessment in Deep Learning-based Atrial Fibrillation Classification. *arXiv preprint arXiv:2011.00121*.
4. Shamsoshoara, A., Afghah, F., Razi, A., **Mousavi, S.**, Ashdown, J. and Turk, K., (2020). An Autonomous Spectrum Management Scheme for Unmanned Aerial Vehicle Networks in Disaster Relief Operations. *IEEE Access*, 8, pp.58064-58079.
5. **Mousavi, S.**, Afghah, F., & Acharya, U. R. (2020). HAN-ECG: An Interpretable Atrial Fibrillation Detection Model Using Hierarchical Attention Networks, *Computers in Biology and Medicine*, Volume 127, 2020, 104057, ISSN 0010-4825, <https://doi.org/10.1016/j.compbimed.2020.104057>.
6. **Mousavi S**, Fotoohinasab A, & Afghah F (2020) Single-modal and multi-modal false arrhythmia alarm reduction using attention-based convolutional and recurrent neural networks. **PLoS ONE Journal** 15(1): e0226990. <https://doi.org/10.1371/journal.pone.0226990>.
7. **Mousavi, S.**, Afghah, F., & Acharya, U. R. (2019). SleepEEGNet: Automated Sleep Stage Scoring with Sequence to Sequence Deep Learning Approach. **PloS ONE Journal**, doi: 10.1371/journal.pone.0216456.
8. Ghazanfari, B., Afghah, F., Najarian, K., **Mousavi, S.**, Gryak, J., Todd, J., (July 2019). An Unsupervised Feature Learning Approach to Reduce False Alarm Rate in ICUs, 41th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (**EMBC'19**).
9. **Mousavi, S.**, & Afghah, F. (2019). Inter-and intra-patient ECG heartbeat classification for arrhythmia detection: a sequence to sequence deep learning approach. In *ICASSP 2019-2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP'19)*, pp. 1308-1312.
10. **Mousavi, S.**, Afghah, F., Razi, A., & Acharya, U. R. (2019). ECGNET: Learning where to attend for detection of atrial fibrillation with deep visual attention. In *2019 IEEE EMBS International Conference on Biomedical & Health Informatics (BHI'19)*. IEEE.
11. **Mousavi, S.**, Afghah, F., Ashdown, J. D., & Turck, K. (2019). Use of a quantum genetic algorithm for coalition formation in large-scale UAV networks. **Elsevier Ad Hoc Networks Journal**, 87, 26-36.
12. **Mousavi, S.**, Afghah, F., Ashdown, J. D., & Turck, K. (April 2018). Leader-follower based Coalition Formation in Large-scale UAV Networks, A Quantum Evolutionary Approach, **INFOCOM**, Workshop on Wireless Sensor, Robot, and UAV Networks (**Best Paper Recognition**).
13. Zaeri-Amirani, M., Afghah, F., **Mousavi, S.** (July 2018). A Feature Selection Method Based on Shapley Value to False Alarm Reduction in ICUs, A Genetic-Algorithm Approach, 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (**EMBC'18**).
14. **Mousavi, S. S.**, Schukat, M., & Howley, E. (2017). Traffic Light Control Using Deep Policy-Gradient and Value-Function Based Reinforcement Learning. **Journal of IET Intelligent Transport Systems**, DOI: 10.1049/iet-its.2017.0153.
15. **Mousavi, S. S.**, Schukat, M. & Howley, E. (2017). Traffic Light Control Using Deep Reinforcement Learning Agent. *NUIG UL 7th Postgraduate Research Day 2017*.
16. **Mousavi, S. S.**, Schukat, M., Howley, E., & Mannion, P. (2017). Applying $Q(\lambda)$ -learning in Deep Reinforcement Learning to Play Atari Games. *Adaptive Learning Agents (ALA) Workshop at Sixteenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS'17)*.
17. **Mousavi, S. S.**, Schukat, M. & Howley, E. (2016). Deep Learning Methodologies in Combination with Reinforcement Learning Techniques. *NUIG UL 6th Postgraduate Research Day 2016*.

18. **Mousavi, S. S.**, Schukat, M., Howley, E., Borji, A., & Mozayani, N. (2016). Learning to predict where to look in interactive environments using deep recurrent q-learning. arXiv preprint arXiv:1612.05753.
19. **Mousavi, S. S.**, Schukat, M., & Howley, E. (2016, September). Deep reinforcement learning: An overview. In Proceedings of SAI Intelligent Systems Conference (pp. 426-440). **Springer**, Cham.
20. Habibalahi, A., Moghari, M. D., Samadian, K., **Mousavi, S. S.**, & Safizadeh, M. S. (2015). Improving pulse eddy current and ultrasonic testing stress measurement accuracy using neural network data fusion. **Journal of IET Science, Measurement & Technology**, 9(4), 514-521.
21. **Mousavi, S. S.**, Ghazanfari, B., Mozayani, N., & Jahed-Motlagh, M. R. (2014). Automatic abstraction controller in reinforcement learning agent via automata. **Elsevier Applied Soft Computing Journal**, 25, 118-128.
22. Moghaddam, A. P., **Mousavi, S. S.** (2012). Learning Decision Tree Using Neural Network for Stability and Flexibility. Iranian Journal of Medical Informatics, IJMI. 1(3), 39-44.

REVIEWER

- **IEEE Transactions on Neural Networks and Learning Systems**
- **Computer Methods and Programs in Biomedicine - Journal - Elsevier**
- **Ad Hoc Networks - Journal - Elsevier**
- **Measurement - Journal - Elsevier**
- **IEEE 88th Vehicular Technology Conference**
- **International Workshop on Wireless sensors and Drones in Internet of Things (Wi-DroIT)**
- **Pacific Symposium of Biocomputing (PSB)**

HONORS AND AWARDS

- Awarded the Graduate Research Assistantship, the School of Informatics, Computing and Cyber Systems, Northern Arizona University, 2017-2020.
- Awarded the SICCS Travel Grant Program (TGP) grant to attend the IEEE BHI 2019 conference, the School of Informatics, Computing and Cyber Systems, Northern Arizona University, Spring 2019.
- Best Paper Recognition: My paper "Leader-follower based Coalition Formation in Large-scale UAV Networks, A Quantum Evolutionary Approach", Workshop on Wireless Sensor, Robot, and UAV Networks (at INFOCOM 2018).
- Recipient of the College of Engineering & Informatics Postgraduate Scholarship at the National University of Galway, Ireland, Oct. 2015. Total award value: €66,116.
- Ranked 77th among more than 20000 participants in the National University Entrance Exam (MS), Iran, 2010.
- Achieved the highest rank in the National University Entrance Exam among software engineering students, University of Zanjan, Iran, 2010.