Sadra Naddaf

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EDUCATION

Lamar University (LU) **Beaumont, TX**
Electrical Engineering / Doctorate in Engineering, GPA: 4.0 *Aug. 2019 – Exp. Aug. 2022*
- Selected Courses: Software Engineering, Machine Learning, Computer Vision, Image Processing.

Ferdowsi University of Mashhad (FUM) **Mashhad, IR**
Computer Engineering / B. Sc., Last 2-year GPA: 16.8/20 *Sep. 2013 - Sep. 2018*
- Courses: Computational AI, AI, basics of Computer Vision.

ACADEMIC EXPERIENCE

Truveta **Seattle, WA**
Research Intern – ML/AI Team *Jan. 2022 – Apr. 2022*
- Achievements will be disclosed by product release.

RICS Lab – Stanley Black and Decker **Beaumont, TX**
Research Assistant – Machine Learning/Deep Learning *Dec. 2020 – Present*
- Designed and trained scalable models for classification, and object detection to assess the quality of radiographic weld images and reduce environmental impacts.
- Published journal and top conference papers (AAAI, IEEE) on state-of-the-art model performance in weld defect assessment.
- Investigated on uncertainty prediction of CNN models using Bayesian approaches
- Achieved AP accuracy of 90% for explainable 10 class object detection on .1M Images with PyTorch model which adds million dollars value to the final product.
- Designed state-of-the-art explainable root cause analysis of multi-variate time-series datasets.

RICS Lab **Beaumont, TX**
Research Assistant – Computer Vision/Deep Learning *May. 2020 – Dec. 2020*
- Contributed to several open-source GitHub repositories such as Google/AutoML, bbaug.
- Employed state-of-the-art deep learning techniques for enhancing training like Data Augmentation, ensemble methods, test-time augmentation, AA, and RA.
- Ranked as 7th team globally, and 4th team among US participants with over 70 teams, in IEEE Road Damage Detection Cup Challenge 2020.
- Achieved 57% F1-score, and Inference Time of 200 image/sec on-road damage object detection and classification using Deep CNNs.

RICS Lab **Beaumont, TX**
Research Assistant *Oct. 2019 – May. 2020*
- Performed 3D reconstruction of areas with sparse features (e.g., tunnels) in real-time on MIT Racecar robot platform on ROS, Nvidia Jetson, Intel Cameras.
- Achieved comparable quality in 3D reconstructed environments with ~ $ 20,000 cheaper hardware.

Advanced Robotics Lab **Mashhad, IR**
Research Assistant and Team Leader *Mar. 2016 – May. 2019*
- Designed and programmed several electronic boards, STM32 ARM micro-controllers and Implemented Device Drivers for magnetometers, RFID, Ethernet, e2prom, and IMU modules.
- Led team of three to implement test setup robot to interpolate magnets and to implement high-speed data-logger
- Performed simulation and implemented evolutionary learning algorithms to localize and minimize localization error on magnetic localization, magnetic localization was used as a control mechanism for the bionic hand.
- Achieved RMSE of 0.58 mm in one magnet Localization, and 1.57 mm in two magnets, which are counted as state-of-the-art in comparison with existed models using dipole magnetic models.

Pasokhplus Software Team/ Akharin Khabar **Mashhad, IR**
Computer vision/backend Developer *Sep. 2016 – Feb. 2019*

- Reimplemented and refactored Pasokhplus multiple-choice grading engine in C++, OpenCV, and Node.js Add-on library for server's back end, ordered by Rose Computer System Inc. (AWS EC2 & docker) and achieved a system that saves hours in grading answer sheets.
- Developed and synchronized a part of the library to be compatible with Cordova plug-ins for IOS.
- Designed and programmed the back-end of a CRM web application due to order Of Khorasan Newspaper.
- Developed using MongoDB and Node.js, REST API and achieved a CRM app that tracks 10,000 customers.

SKILLS & INTERESTS

Programming: Python, C/C++, Node.JS, MATLAB. **Familiar:** Java.

Libraries: PyTorch, Keras, TensorFlow, OpenCV, Spark, Pandas, scikit-learn, NumPy.

Embedded System: AVR, ARM (STM32, TI MSP), Arduino, RTOS, Nvidia Jetson, Raspberry Pi.

Database: MongoDB, **Familiar:** SQL.

Robotics: ROS, sensors, modules, Mocap. **Protocols:** SPI, I2C, UART, ADC.

Other: Latex, Microsoft Office, VSCode, git, docker, Linux command line

SELECTED PUBLICATIONS

- **Naddaf-Sh, Sadra et al**. "Explainable Models for Multivariate Time-series Defect Classification of Arc Stud Welding." *2022 (2022). Under review.*
- Mobtahej, P., **Naddaf-Sh, Sadra**, et al. "Combining Root Cause Analysis and Machine Learning-based Approach for Anomaly Detection Using Compressors Timeseries Data" Proceedings of IISE 2022 Conference and Expo. IISE, (2022).
- **Naddaf-Sh, Sadra** et al. "Real-Time Explainable Multi-class Object Detection for Quality Assessment in 2D Radiographic Images." *Complexity 2022 (2022). Will be online by mid-june.*
- Naddaf-Sh, M-Mahdi, **Naddaf-Sh, Sadra** et al. "Defect detection and classification in welding using deep learning and digital radiography." *Fault Diagnosis and Prognosis Techniques for Complex Engineering Systems*. Academic Press, 2021. 327-352.
- **Naddaf-Sh, Sadra**, et al. "An efficient and scalable deep learning approach for road damage detection." *2020 IEEE International Conference on Big Data (Big Data)*. IEEE, 2020.
- Naddaf-Sh, M-Mahdi, **Naddaf-Sh, Sadra** et al. "Next-Generation of Weld Quality Assessment Using Deep Learning and Digital Radiography." Proceedings of AAAI 2020 Spring Symposium. AAAI, (2020).
- Golestani S., Rafei, H., Akbarzadeh-T, M. R., Akbarzadeh, A., Naddafshargh, A., and **Naddaf-Sh, S.** "Robust Real-time Magnetic-based Object Localization to Sensor's Fault using Recurrent Neural Networks." *2019 9th International Conference on Computer and Knowledge Engineering (ICCKE)*. IEEE, 2019.
- Moqadam, S. B., Jafarzadeh, H., **Naddaf, S.** et al. "Simplifying user interaction solutions for the FUM Bionic Hand-I." *2016 4th International Conference on Robotics and Mechatronics (ICROM)*. IEEE, 2016.
- **Naddaf-Sh, S.** et al. "Design and Implementation of a Multiple Permanent Magnet Tracking System" *Under Review*
- Moradi A., Rafiei H., Daliri M., Akbarzadeh M.R., Akbarzadeh A.R, **Naddaf** et al. " Kineticomyographic-Controlled Prosthetic Hands." *Under Review*

PROFESSIONAL ACTIVITIES

- 4th place in IEEE Big Data Cup Challenge – Road Damage Detection 2020
- 3rd Place at RoboCup IranOpen International Competition – FUM Bionic Hand 2018
- Reviewer at Complexity Journal-Hindawi 2021
- Established Member StackOverflow