

# Sadra Naddaf

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<https://scholar.google.com/citations?hl=en&user=7Zl2X9gAAAAJ> |  
<https://stackoverflow.com/users/1076264/sadra-naddaf>

## EXPERIENCE

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- Truveta** **Bellevue, WA**  
*Senior Machine Learning Engineer – ML/AI Research Team* *May. 2023 – Present*
- Truveta** **Bellevue, WA**  
*Machine Learning Engineer – ML/AI Research Team* *Aug. 2022 – May. 2023*
- LLMs in practice for ontology matching, Electronic Health Record concept extraction, normalization surpassing human and SOTA performance.
  - Active learning, LLM pre-training, weak supervision.
- RICS Lab – Stanley Black and Decker** **Beaumont, TX**  
*Research Assistant – Machine Learning/Deep Learning* *Dec. 2020 – Aug. 2022*
- 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.
- Truveta** **Bellevue, WA**  
*Research Intern – ML/AI Research Team* *Jan. 2022 – Apr. 2022*
- Achievements will be disclosed by product release.
- 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 7<sup>th</sup> team globally, and 4<sup>th</sup> 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 backend 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.

## EDUCATION

**Lamar University (LU)** **Beaumont, TX**  
*Electrical Engineering / Doctorate in Engineering* 2022

**Ferdowsi University of Mashhad (FUM)** **Mashhad, IR**  
*Computer Engineering / B.Sc.* 2018

- Courses: Computational AI, AI, basics of Computer Vision.

## SKILLS & INTERESTS

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

**Libraries:** PyTorch, Keras, TensorFlow, huggingface, Pandas, OpenCV, Spark, 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 S.** et al. "Application of Machine Learning in Automotive Stud Weld Defect Classification" (2023). Under Review.
- Amir M., Baruah M., Eslamialishah M., Ehsani S., Bahramali A., **Naddaf-Sh S.**, Zarandioon S. "Truveta Mapper: A Zero-shot Ontology Alignment Framework." *arXiv preprint arXiv:2301.09767* (2023). Under Review.
- **Naddaf-Sh, Sadra** et al. " Explainable Models for Multivariate Time-series Defect Classification of Arc Stud Welding." *International Journal of Prognostics and Health Management*, 2023, 14(3).
- Moradi A., Rafiei H., Daliri M., Akbarzadeh M.R., Akbarzadeh A.R, **Naddaf** et al. " Kineticomyographic-Controlled Prosthetic Hands." *Nature Scientific Reports*, 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).

## PROFESSIONAL ACTIVITIES

- 4<sup>th</sup> place in IEEE Big Data Cup Challenge – Road Damage Detection 2020
- 3<sup>rd</sup> Place at RoboCup IranOpen International Competition – FUM Bionic Hand 2018
- Established Member StackOverflow