Sadra Naddaf

Graduate Student · Computer Engineer

Beaumont, TX, U.S.A.

(+1) 409-499-1613 | naddafsadra@gmail.com | snaddafsharg@lamar.edu | sadra.dev | sadransh | sadra-naddaf | sadra-naddaf

Education

Lamar University (LU) — *Beaumont, TX*

Doctorate in Electrical Engineering — *Aug. 2019 - Present*

Master of Computer Science — *Aug. 2020 - present*

- GPA : 4.0/4.0

Ferdowsi University of Mashhad (FUM) — *Mashhad, Iran*

B.Sc. in Computer Engineering — *Sep. 2013 - Sep. 2018*

- Thesis Title : Multiple Magnet Localization with Medical Applications

Skills

Programming	C/C++, Matlab, Node.js., Python **Familiar:** HTML, Node add-ons, Linux Shell Programming, device tree (DTS).
Embedded Sys.	ARM ST controller(STM32Cube, eclipse), **Experienced:** Linux-Based Embedded Sys. (e.g., NVIDIA Jetson, raspberry pi, Odroid). **Familiar:** AVR and ARM LPC series, Arduino, TI MSP microcontrollers (code composer, MSP432E4 series)
Circuit Design	Altium Desinger, Proteus(simulation).
Robotics	ROS(Robot Operating System), robotics principles, sensors, modules, MoCap.
Database	NoSQL (MongoDB) , relational Database under course (database principals). **Familiar:** Spark.
Machine Vision	**Experienced:** Pytorch, Matlab, OpenCV, Intel RealSense Cameras. **Familiar:** Tensorflow, Keras.
Other	Microsoft Office, TEX, Visual studio, Eclipse, VScode, git, Docker, Linux OS command line.

Experience

Road Damage Object Detection and Classification Using SOTA Deep CNN — *Beaumont, TX*

Research Assistant, RICS LAB — *Oct. 2019 - Present*

- Experienced with State of the art Object Detection Deep CNNs. ranging from ResNets, to EfficientDet.
- Hands-on with python, pytorch, and SOTA research platforms(e.g., detectron2 ...)
- Implemented a family of modern, scalable and efficient damage detectors with AP_{50} 53.6, F1-score 56.5% and Inference Time 200 images/sec.
- familiar with different mechanisms to enhance the process of training and deploying a network (e.g. Auto-Augment, mixed precision training, ensemble methods, TTA, ...)
- Contributed to several Open-source GitHub repositories e.g. google/autoML, bbaug, ...

SLAM-Based 3D reconstruction on mobile robot and Motion Capture(MoCap) Analysis of multiple Crazyflie Drones. — *Beaumont, TX*

Research Assistant, RICS LAB — *Oct. 2019 - Present*

- Experienced with ROS, MIT racecar platform, Intel Realsense Cameras, NVIDIA Jetson Boards, Crazyflie Drones.
- 3D reconstruction of areas with sparse features(e.g. tunnels) and implementation of swarm algorithms.
- Fusing different Odometry sources.
- Experienced different ROS tools e.g., RTABMAP, RVIZ, TF.
- Developed an Interface for linking MoCap to ROS and Matlab swarm Robotics algorithm to ROS .

Coral Detection and classification by Image Segmentation — *Beaumont, TX*

Freelance — *March. 2020 - May. 2020*

- pre-process images using PIL and OpenCV and anotated.
- segmented images of 8 different categories of corals with the accuracy of mIoU 60.1 %.

FUM Bionic Hand-III R&D Project — *Mashhad, Iran*

Research Assistant, FUM Advanced Robotics LAB — *Mar. 2016 - May. 2019*

- Performed Simulation, Machine Learning(NN), Optimization(GA, LM, Fmincon,), Electronic board design and soldering, ARM micro-controller Programming and module, Report Writing, and team managing.
- The 'Fum Bionic Hand-III is a project to develop a bionic hand that aims to rehabilitate disabled people. The exclusive characteristic of this device is the reproduction of body's muscle muscle movement by detecting movements through magnet's movements, which is implanted inside the body. My thesis was based on localizing and tracking magnets to mimic actual body muscle movements.
- At the moment, magnets are implemented in hand of a disabled person and the development is on going.

FUM Lawn Mower Project

Mashhad, Iran

Research Assistant, FUM Advanced Robotics LAB — *June. 2016 - Jul. 2018*

- Developed Obstacle detection System(ultrasonic), Wireless Programmer for programming STM32, and Ethernet Module over STM32.
- Researched for Real-time Human Detection on Embedded Systems for lawn Mover robot. (HOG detector)
- This Project was aimed to design an automated lawnmower to cut grass in urban areas and it is in use at the moment to reduce workload in vast urban areas.

CRM Web-Application (Ordered by Khorasan Newspaper)

Mashhad, Iran

Node.JS Back-end Developer — *Sep. 2017 - Jun. 2018*

- Designed back-end and back-end programming of a CRM web application due to order Of Khorasan Newspaper.
- Developed using MongoDB and Node.js, REST API (front-end is Angular 4)
- To the best of my knowledge the product is in use and develop by the marketers of the company.

Pasokhplus Software Development Team

Tehran & Mashhad, Iran

Back-end Developer, Computer Vision Developer — *Sep. 2016 - Feb. 2019*

- Pasokhplus is a mobile software started by Ferdowsi University Students, which aims to Speed up the process of grading multiple-choice Tests. This software can grade a multiple Choice test Answer sheet in less than 300ms with Image processing (depend on the System). See Pasokhplus.ir (in Persian)
- Developed C++, OpenCV, and Node.js Add-on library partly for a server's back-end. Ordered by Rose Computer System Inc(AWS EC2 & docker).
- The product is a now a part commercial products(Lernito app platform and Pasokhplus Android Application.)
- Developed and Synchronized a part of the library to be compatible with Cordova plug-ins for IOS.

IP-phone Project

Mashhad, Iran

embedded Linux OS developer — *Sep. 2017 - Dec. 2017*

- initializing peripherals with device tree(DTS)(specifically WM8960 sound codec) On LEDE and OpenWRT embedded Linux OS. The implementation is used as a part of commercial product.
- A project aimed to design a phone based on IP.

Robotics Association

Mashhad, Iran

Embedded Designer and Developer — *Aug. 2015 - Apr. 2016*

- Developed RFID gesture detection For FUM Bionic Hand-I, resulted as One patent and one paper publication.
- Experienced in designing and implementing Security Door lock Based on RFID. Used as prototype of a commercial product.
- Designed and Implemented IoT devices with Application in Building Management Systems. Used as prototype for fundraising (RFID-Wireless modules(ESP12)-Touch Sensors)

Honors & Awards

2020	**4th Place ,** IEEE BigData Big Cup Challenge - Road Damage Detection 2020(among USA participants)	*Atlanta, GA, USA*
2018	**3rd Place,** RoboCup IranOpen International Competitions - Fum-BionicHand in senior Demo League	*Tehran, Iran*
2016	**Cultural Superior booth,** 19th Int. Exhibition of Computer IRANCOM and 6th Exhibition of SMART CITY	*Mashhad, Iran*
2013	**TOP 3%,** national Iranian Universities entrance exam, very competitive with nearly 330,000 participants.	*Iran*

Teaching Experiences

2017	**Introduction to Computer Engineering Course,** Assistant	*Mashhad, Iran*
2017	**Artificial Intelligence Course,** Assistant Team Member	*Mashhad, Iran*
2017	**Robotics principles Course,** Assistant	*Mashhad, Iran*
2016	**STM32 ARM microcontroller Programming Courses(two courses),** Assistant	*Mashhad, Iran*

Publications

An Efficient and Scalable Deep learning Approach for Road Damage Detection — *2020*

Sadra Naddaf-sh, M-Mahdi Naddaf-sh, Amir Kashani, Hassan Zargarzadeh — *Submitted to IEEE BigData*

DESIGN AND IMPLEMENTATION OF A MULTIPLE PERMANENT MAGNET TRACKING SYSTEM — *2020*

Sadra Naddaf-sh, Amirmohammad Naddaf Shargh, Mojtaba Izadi, Alireza Akbarzadeh — *To be Submitted*

Next-Generation of Weld Quality Assessment Using Deep Learning and Digital Radiographic Images — *2020*

M-Mahdi Naddaf-Sh, Sadra Naddaf-Sh, Hassan Zargaradeh, Mohammad R. Zahiri, Amir R.Kashani — *AAAI Spring Symposium*

Robust Real-time Magnetic-based Object Localization to Sensor's Fault using RNN — *2019*

S. Naseri-G, H. Rafei, M. Akbarzadeh, A. Akbarzadeh, A. Naddaf and S. Naddaf shargh — *9th ICCKE*

Simplifying user interaction solutions for the FUM Bionic Hand-I — *2016*

S. Bahrami M., Hamed Jafarzadeh, Sadra Naddaf, Sina Darvishi, Seyyed Alireza Esfahani, Pouya Pishbin, Farsad Babazadeh, Aryan Makhdoumi, Alireza Akbarzadeh, and Ahmad Hajipour — *4th Int. Conf. on Robotics and Mechatronics (ICROM)*