Dr. Ghaith Al-refai

Amman, Jordan

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Education:

Oakland University, Rochester, MI	Sept. 2014-Dec. 2018
PhD in Electrical and Computer Engineering	GPA 3.91

Oakland University, Rochester, MI	Sept. 2012-April.2014
Master's Degree in electrical and Computer Engineering	GPA 3.82

Jordan University of Science and Technology, Irbid, Jordan	Sept.2005-Feb.2010
B.Sc. Degree in Electrical Engineering	GPA 86.5%

Experience:

Assistant Professor, German Jordanian University, Jordan   **Feb.2022-Now**

> **Highlights:**

- Work as assistant professor at German Jordanian University in the department of Mechatronics and AI under the school od Applied Technical Sciences
- Courses I taught: Mechatronics systems design, Microcontrollers and IOT, Control systems, and Instrumentations and measurements
- Research area: AI, computer vision, machine learning, Neural networks, Autonomous driving, Image processing and Intelligent controls

Senior Systems Engineer, Robert Bosch LLC, MI   **July.2018-Jan.2022**

> **Highlights:**

- Stereo vision camera for autonomous driving application systems engineer and system architect
- Product requirements and function development
- Convolutional neural network (CNN) development for road object detection such as vehicles, pedestrians, and traffic signs.
- In-vehicle Product integration and installation
- Supporting tools: Canoe, Canalyzer, Lauterbach, MATLAB, C, C++, Python

Senior Systems Engineer, Clarion Corporation of America, MI, USA   **March.2016 July.2018**

> **Highlights:**

- Audio head unit system architect and requirement development
- Extract requirements from customer documents to DOORS
- Requirements test and validation in bench and vehicle, update the result reports
- Technical project management: customer interface for software releases timing, bug fixes and issues
- Ford Part I and MUX testing, Ford DET for diagnostic and flashing

Product Systems Engineer, TRW Automotive, MI, USA   **Feb.2014-March.2016**
Highlights:

- Front Camera testing and validation
- Requirement review and test specification development per requirements
- Performing test on vehicle and bench, create test report
- Plant support at the end of the line for product verification
- Data analysis using MATLAB, and Microsoft excel
- DFMEA implementation using FMEA IQ
- Reviewing circuit schematics and update top-level drawing

Systems Engineer, Magna Electronics, MI, USA   **Sept.2013-Feb.2014**
Highlights:

- Trailer angle detection (TAD) using image processing Module B (IPMB) ECU with rear camera
- Data logging of CAN and LIN buses using CANOE and NEOVI on vehicle and HIL
- Diagnostics, bus simulation, using DET (Diagnostic Engineering Tools), CANOE and Vehicle Spy
- Data analysis using MATLAB, Labview, and Microsoft Excel

PhD researcher at Oakland University, MI   **Sept.2014-Dec.2018**
Highlight:

- PhD dissertation title: Improved Candidate Generation for Pedestrian Detection Using Background Modeling in Connected Vehicles
  - The goal of the research was to develop an improved pedestrian detection system using computer vision and connected vehicles
  - Histogram Oriented gradient (HOG) for feature extraction and Support Vector Machine (SVM) for classification were used as a reference algorithm for pedestrian detection
  - A new model for pedestrian detection was developed by using background modeling in connected vehicles for improved candidate generation
  - Gaussian Mixture Model (GMM) was utilized for background modeling and foreground pixels extraction
  - The proposed model was implemented in MATLAB and compared to the reference algorithm

Full Time Teaching Assistant and Research Assistant, Oakland University, MI
Sept.2012-Sept.2013
Highlights:

- Lab instructor for Microcontroller systems course, Arduino and HCS12 Microcontroller applications
- Researcher at Chrysler Hardware in loop (HIL) laboratory
- Use the HIL setup in fuel economy study project

Recent Publications:

- Al-refai, Ghaith, Hisham Elmoaqet, and Mutaz Ryalat. "In-Vehicle Data for Predicting Road Conditions and Driving Style Using Machine Learning." Applied Sciences 12, no. 18 (2022): 8928.
- Al-refai, Ghaith, and Mohammed Al-refai. "Road Object Detection using Yolov3 and Kitti Dataset." International Journal of Advanced Computer Science and Applications 11.8 (2020).

- Tashtoush, Yahya, Mohammed Al-refai, Ghaith Al-refai, N. Zaghal, D. Darweesh, and Omar Darwish. "Dynamic Traffic Light System to Reduce The Waiting Time of Emergency Vehicles at Intersections within IoT Environment." International Journal of Computers, Communications & Control 17, no. 3 (2022).

- Ghasemi, Zeinab, Shadi Banitaan, and Ghaith Al-Refai. "Automated chagas disease vectors identification using data mining techniques." In 2020 IEEE international conference on electro information technology (EIT), pp. 540-545. IEEE, 2020.

- Ghaith Al-refai, Mohammed Al-refai, Shadi Banitaan, "Connected-Vehicles Shared Images Registration System Using Harris-Stephens Approach", SAE Technical Paper, 2020.

- Al-refai, Ghaith, Modar Horani, and Osamah A. Rawashdeh. "A Framework for Background Modeling Using Vehicle-to-Infrastructure Communication for Improved Candidate Generation in Pedestrian Detection." 2018 IEEE International Conference on Electro/Information Technology (EIT). IEEE, 2018.

- Al-refai, Ghaith N. "Improved Candidate Generation for Pedestrian Detection Using Background Modeling in Connected Vehicles." PhD diss., Oakland University, 2018.

- Horani, Modar, Ghaith Al-Refai, and Osamah Rawashdeh. Towards Video Sharing in Vehicle-to-Vehicle and Vehicle-to-Infrastructure for Road Safety. No. 2017-01-0076. SAE Technical Paper, 2017.

Computer Skills:

Programming Languages:	Python, MATLAB, C
Python libraries:	Open CV, TensorFlow, Keras, Matplotlib
Development Tools:	Pycharm, visual studio, CodeWarrior, Raspbian, PSoC Designer, CAN, Labview.
Applications:	DOORS, MKS, RQM, Redmine, Latex, Office
Microcontrollers:	Arduino Uno, Raspberry pi, JetsonNano.

Languages:

Arabic:	Native language
English:	Very fluent (reading, writing, speaking, and listening)