Mohamad Issam Sayyaf

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Summary

Engineer with extensive experience in telecommunication, embedded Linux , embedded systems, AI, and wireless communication. Proven track record in designing and implementing complex systems and contributing to academic research.

Education

Nov/2023 - Nov/2026 PhD's Degree in Signal Processing,
University of Gustave Eiffel, France
Thesis: Anomaly Detection for Positioning Signals (IMU, GNSS, and 5G)
Focused on developing robust anomaly detection methods in real-time positioning systems.

Sep/2021 - Oct/2023 Master's Degree in Telecommunication Engineering: Smart Sensing, Computing, and Networking,
University of Calabria, Italy ***GPA: 110/110 cum laude (honour)***
Thesis: "Design and Realization of a Wireless Crack Detection System Based on IoT and Acoustic Emission."

Sep/2014 - Sep/2019 Bachelor's Degree in Electronics Engineering (Communication Engineering),
University of Aleppo, Syria ***GPA: 88.56% with distinction***
Thesis: "Implementation of a Free Space Optical System Using LASER and Secure Data Transferring by AES Algorithm."

Work Experience

Researcher, Gustave Eiffel University, France Nov/2023 - Present

- Signal Processing, Deep learning, and Anomaly detection

Researcher Assistant, Fraunhofer IIS, Germany Nov/2023 - Present

- Signal Processing, Deep learning, and Anomaly detection

Embedded System Engineer, Hexabitz , USA (Freelancer) Jun/2023 - 2024

- Proficient in STM32FX, STM32MP1, and NXP MPU platforms, with expertise in bootloader configuration, BSP adaptation, and peripheral integration to enable high-performance applications in real-time and industrial environments.
- Skilled in using the Yocto Project for building and customizing Linux images, ensuring optimized performance and tailored functionality for specific hardware needs.
- Experienced with Real-Time Operating Systems (RTOS), implementing configurations and optimizations to support low-latency and time-sensitive applications.

Measurement Engineer (Part Time), University of Calabria, Italy Oct/2022 - Oct/2023

- Designed and implemented a distributed measurement system using LabVIEW, providing real-time data acquisition and monitoring for IoT applications.

Teaching Assistant, University of Aleppo, Syria Sep/2020 - Aug/2021

- Taught Lab courses:Antenna Engineering.
  1. Microwaves Engineering,
  2. Radar Engineering,
  3. Antenna Engineering.

Courses Lecturer, Self-employed Sep/2019 - Aug/2021

- Lectured on Embedded Systems

Projects

Anomaly Detection to Improve Step Detection Algorithms

- Developed an advanced AI algorithm capable of distinguishing between genuine walking signals and mimic walking signals, enhancing the accuracy and reliability of step detection systems.
- Optimized the algorithm for real-time performance, enabling seamless integration with wearable devices and mobile applications for accurate pedestrian tracking.

Truck Monitoring System using IoT

- Customized a Linux image for the Airbox board using the Yocto Project, tailoring the environment to meet specific system requirements.
- Added support for Wi-Fi, Bluetooth, Ethernet, USB, LTE, GNSS and ADC interfaces to provide comprehensive connectivity options and versatile data acquisition capabilities.

Wireless Crack Detection Sensor Using Acoustic Emission

- Designed a wireless sensor system to detect structural cracks in real-time using acoustic emission technology, enabling early warning and preventive maintenance.
- Developed algorithms to analyze acoustic signals for identifying characteristic emissions associated with crack formation and propagation.
- Integrated wireless communication protocols to allow remote monitoring and data transmission, enhancing accessibility and reducing inspection time in industrial applications.

RSNA Screening Mammography Breast Cancer Detection

Implemented advanced AI techniques to detect breast cancer from mammography images, contributing to early diagnosis and improved patient outcomes.

Contradictory Text Analysis using NLP and Deep Learning

Developed a deep learning-based NLP model for analyzing and detecting contradictions in text, enhancing accuracy in automated text analysis.

Performance Evaluation of Dijkstra and Bellman-Ford Algorithms in SDN

Evaluated performance of routing algorithms in Software Defined Networks.

Load Balancing Technique for Face Recognition Video Streaming in SDN

Developed load balancing techniques to improve face recognition over wireless networks.

Free Space Optical System Using LASER

Studied and implemented an optical communication system using LASER.

Smart Home using ESP32 and IoT MQTT TCP IP protocol with Node-Red

Designed a smart home system integrating ESP32 with IoT protocols and Node-Red.

Android Application to Control Smart Home using Firebase

Developed an Android app to control smart home devices using Firebase cloud.

Design an Array Antenna for 5G (28/38) GHz

Designed an array antenna system for 5G communication.

Publications

- Sayyaf, M.I, et al, "Step Detection Enhanced by Anomaly Filtering," in Proc. Intl. IEEE Applied Sensing Conference (APSCON), Jan 2025, pp. 1–4.

- Sayyaf, M.I., et al, "Wireless Crack Detection System Based on IoT and Acoustic Emission," 2023 IEEE INTERNATIONAL WORKSHOP ON Metrology for Living Environment, 29 May 2023, Milan, Italy. http://dx.doi.org/10.1109/MetroLivEnv56897.2023.10164053
- Sayyaf, M.I., et al, "Detection and Classification of Crack for Heritage Building," Metro Archaeo 2022, Cosenza, Italy.
- Sayyaf, M.I., Carni, D.L., Lamonaca, F. 2023. Heart Rate Evaluation by Smartphone: An Overview. In: Spinsante, S., Iadarola, G., Paglialonga, A., Tramarin, F. (eds) IoT Technologies for HealthCare. HealthyIoT 2022.

Skills

Artificial Intelligence	ANNs, CNNs, LSTMs, GANs, GCNs, GATs, and Transformers. Experienced with model calibration and managing uncertainty. Skilled in Reinforcement Learning and TinyML.
Embedded Systems	Embedded Linux (customize image using YOCTO, Buildroot, kernel programming, device driver) and ARM Cortex-M , Real-Time Operating Systems (RTOS) FreeRTOS, and knowledge about Zephyr OS.
Smart Networks	Competent in Software Defined Networks (SDN) architecture and applications.
Wireless Communication	GSM, GPRS, EDGE, UMTS, HSPA, LTE, and 5G, alongside proficiency in Wi-Fi, Zigbee, Bluetooth, and LoRaWAN.
IoT Protocols	MQTT, CoAP, 6LowPAN, and HTTP.
Software and Programming Languages	Python, C/C++, Java, Linux environments.
CAD Tools	MATLAB, LabVIEW, Altium Designer, Multisim, Mininet, HFSS, and CST Microwave Studio.
Research Skills	Skilled in academic research, proficient in paper writing, literature reviews, and document preparation using LaTeX.

Languages

Arabic	Mother tongue
English	B2
French	A2

Honors & Awards

2022	BEST PAPER AWARD, *EAI Healthy IoT 2022*, Oct 2022, "Heart Rate Evaluation by Smartphone: An Overview." https://healthyiot.eai-conferences.org/2022/best-paper-award/
2022 - 2023	University of Calabria Scholarship for 2022–2023, including free services (tuition fee, accommodation, meals) and pocket money of €3,500.00.
2021 - 2022	University of Calabria Scholarship for 2021–2022, including free services (tuition fee, accommodation, meals) and pocket money of €1,700.00.

Courses and Certificates

Course	Date	Organizer
Yocto Project and OpenEmbedded System Development	Jul 2024	Bootlin
Embedded Linux system development	Apr 2024	Bootlin
AiBy4 Summer School 2024	Jun 2024	Nantes University
Transformer Models and BERT Model	Mar 2024	Google
Sample-based Learning Methods	Sep 2023	Alberta University
Fundamentals of Reinforcement Learning	Aug 2023	Alberta University
Mastering RTOS: Hands on FreeRTOS and STM32Fx with Debugging	Aug 2023	Udemy
Signal Processing Onramp	Jul 2023	MathWorks
Wireless Communications Onramp	Jul 2023	MathWorks
Applications of TinyML	Dec 2022	Harvard University
Fundamentals of TinyML	Dec 2022	Harvard University
PCB design with Altium Designer 22	Nov 2022	Udemy
Exploring AWS IoT	Nov 2022	Udemy
Data Acquisition with LabVIEW	Nov 2022	LinkedIn
Learning LabVIEW	Oct 2022	LinkedIn
Building Deep Learning Models with TensorFlow	Aug 2022	IBM
Deep Neural Networks with PyTorch	Aug 2022	IBM
Drones for measurements	Jun 2022	Unical
Deep Learning & Neural Networks with Keras	Jun 2022	IBM
Machine Learning with Python	Jun 2022	IBM
Simulink Onramp	May 2022	MathWorks
Embedded Software and Hardware Architecture	Feb 2022	Colorado University
Introduction to Embedded Machine Learning	Feb 2022	Edge Impulse
Python for Data Science, AI & Development	Feb 2022	IBM
Microwave Engineering and Antennas	Feb 2022	Eindhoven University