Mounir Dakkak

Software Designer
Expert in embedded systems, full-stack development, and Data, with a keen interest in data collection and analysis, artificial intelligence, and cybersecurity. With professional experience in passenger information systems and software automation, I combine strong programming skills with practical knowledge of hardware interfaces and networking protocols to deliver robust solutions for complex technical challenges.

Contact Information

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- **LinkedIn:** Profile
- **GitHub:** Profile

Work Experience

Software Designer, Luminator Technology Group, Lévis, QC (10/2023 - Present)

- Developed and maintained object-oriented C++ and C code for passenger information systems in embedded applications.
- Implemented messaging protocols/middleware for IPC and device communication (**ZMQ, MQTT**).
- Developed a web-based Maintenance Service Tool for system monitoring, command execution, and log management using **PHP, JavaScript, Bootstrap**, and JSON data handling.
- **Git Maintainer:** Acted as the Git Maintainer for the project's processes and libraries, managing quality code reviews, merge requests, and system integration.
- Engineered embedded Linux solutions using **Yocto**, including custom Bitbake recipe development and the integration of different process modules for a project with an 8-person team.
- Participated in the design of the architecture for a passenger information system by designing the workflow and functionality of system-wide devices.
- Worked with various network protocols (TCP/UDP, SNMP, TRDP) and utilized analysis tools such as **Wireshark**, **tcpdump**, and **tcpreplay** for debugging and optimization.
- Authored Python scripts for system updates and automated testing procedures.
- Fixed memory leaks using **Valgrind**.
- Implemented hardware control interfaces for audio codecs and LED control systems.
- **On-site Support:** Traveled for customer support, maintenance, and integration at client locations.

Software Automation Test Engineer (Co-op Student), Lumentum, Ottawa, ON (01/2022 - 04/2022)

- Authored and debugged optical device test scripts using **Python (PyVisa)** and **VB.NET**.
- Streamlined test automation, increasing efficiency and accuracy.
- Effectively used **Jira** for task management and project tracking.
- Utilized **Pandas**, **Matplotlib**, and **Seaborn** to create insightful data visualizations.
- Prepared comprehensive reports, presentations, and documentation.

Skills

Programming & Development

- **Languages:** C++, C, Python, PHP, Java, VB.NET
- **Web Technologies:** JavaScript, HTML, CSS, Bootstrap 3/5, React, Vue.js, Flask
- **Databases:** MySQL, PostgreSQL, SQLite, MongoDB

Embedded Systems & Hardware

- **Embedded Linux:** Yocto (integration of various process modules for an 8-person team), Bitbake
- **Hardware:** Microcontrollers, sensors, peripherals, VHDL, Motorola HCS12, Arduino, BeagleBone, Raspberry Pi, i.MX6

Networking & Protocols

- **Network Analysis & Tools:** Wireshark, tcpdump, tcpreplay (for debugging protocols such as TCP/UDP, NTP, SNMP, TRDP)
- **System Access:** SSH, SFTP
- **IPC:** ZMQ, MQTT

DevOps & Tools

- **Version Control:** Git, GitHub Actions, **GitLab**
- **Containerization:** Docker
- **CI/CD:** YAML, pytest, Azure

Machine Learning, Data & Computer Vision

- **Data & Visualization:** Pandas, Matplotlib, Seaborn
- **Libraries:** scikit-learn, PyTorch, PIL, OpenCV
- **Frameworks:** scikit-image, YOLOv5

Additional

- Experience diagnosing and fixing memory leaks using **gdb**, **nmon** and **Valgrind**.
- Strong interest in data collection, analysis, artificial intelligence, and cybersecurity.

Education

Bachelor's Degree in Computer Engineering
University of Ottawa (September 2019 - April 2023)
Average: 8.4/10

Projects

- **Complete Web Scraping Solution for Real Estate Data** (Video Presentation)

  Developed a comprehensive web scraping solution comprising:

  - A scraping module to collect real estate data from various online sources.
  - A scheduling module to efficiently manage scraping tasks.
  - A control UI for monitoring and managing the scraping process.
    The scraped data is stored in a **MongoDB** database.

- **Smart Parking Space Detection System** (GitHub Repository)

  - Engineered a YOLOv5-based real-time parking space detection model using Python and OpenCV.
  - Implemented computer vision algorithms to identify available and occupied parking spaces.

- **CI/CD and DevOps Project** (GitHub Repository)

  - Integrated CI/CD practices including automated testing and Docker containerization.
  - Developed a Flask website and API connected to a PostgreSQL database.

- **Database-driven Hotel Reservation System** (Video Presentation)

  - Created a comprehensive hotel management website using Vue.js, Node.js, and MySQL.
  - Implemented a full booking system with user authentication and administrative features.

- **16-bit CPU Implementation Based on MIPS**

  - Designed a simple 16-bit CPU based on the MIPS architecture using VHDL.
  - Implemented on an Altera DE2-115 FPGA board using Quartus II.

Languages

- **French:** Fluent
- **English:** Intermediate
- **Arabic:** Native