Ragab Elsayed

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SUMMARY

Software engineer with 5+ years of experience in C/C++ development, Linux system programming, kernel development, and embedded systems. Skilled in C++11/14/17, Qt, STL, multi-threading, OOP, design patterns, and device driver development. Strong background in problem-solving, optimization, algorithms, and debugging, with a focus on efficient, reliable solutions and cross-functional collaboration.

WORK EXPERIENCE

C/C++ Developer | Embedded Software Engineer, Al-Muttahida Trading and Manufacturing Co, *2018 – Present*

- Designed and developed **the ProLED Flasher 30x** using a **PIC16F887 microcontroller**, controlling **30 independent LED lines** with programmable flashing patterns and sequences.
- Implemented **modular C code** with an API for LED control, including **ADC driver integration** to monitor analog inputs and synchronize flashing sequences.
- Delivered a **low-cost light flasher system** for an Egyptian client using **PIC12F675**, implementing on/off speed monitoring, ADC-based sensing, and a **synchronizer driver** for flash pins.
- Utilized **MPLAB X IDE, XC8 Compiler, and PIC programmer tools** for firmware development and deployment.
- Optimized microcontroller resource usage to ensure **real-time performance** and reliable operation under constrained hardware.

C/C++ Developer/Embedded Linux Engineer/Embedded Software Engineer, freelancer.com 2017-Present

- Designed and developed **high-performance C/C++ applications** for Linux, including tools for **encryption, compression, and client-server communication**.
- Implemented **Linux socket programming** (TCP/UDP) and **multithreaded applications**, such as a mail server with **HTTP/JSON APIs** and **SQLite database integration**.
- Built and customized **embedded Linux systems** using **Yocto Project, BusyBox, and cross-compilation toolchains** for ARM-based platforms.
- Developed and debugged **Linux device drivers** (UART, ADC, GPIO) and integrated them with user-space applications.
- Applied **networking and security protocols**, implementing **AES-256 and RSA encryption** with secure JSON-over-TCP communication.
- Automated builds and testing using **GNU Make, CMake, Jenkins, and Docker** for scalable and reproducible environments.
- Collaborated with clients to deliver **real-time, resource-constrained solutions**, ensuring **optimized memory and CPU usage** in embedded systems.

Selected Achievements:

- **Bank System.**

  Description: A command-line banking system providing account management and transaction operations with dual persistence (SQLite3 and JSON)**.**

  Technology: *(C++ lang, OOP, CLI interface, SQLite3 database, JSON serialization, Configurable persistence layer, CMake build system).*
- **File Encryptor Tool.**
  Description: A GUI tool that allows users to encrypt and decrypt files using AES-256-CBC.
  Technology :*(C++ lang, OOP, Qt 5.15+, CLI interface, Implement QT QML GUI for the tool, Implement* AES-256-CBC *algorithms with a* 256-bit *key generated from input password*).
- **Simple Mail Server.**

  Description: An HTTP&TCP-based mail server facilitating basic email functionalities, implements SQLite for message storage and employs JSON for client-server communication

Technology :*(C++ lang, OOP, CLI interface,* Multithreading*, SQLite Database, socket programming, JSON, HTML page)*.

- **Sorting Algorithm Comparison Tool.**

  Description: a comprehensive sorting algorithm benchmark tool designed to evaluate and compare the performance of various sorting algorithms in terms of execution time.
  Technology :*(C++ lang, OOP, CLI interface, Random Number Generator library, implement various sorting algorithms, implement TimeManager class for calculating time complexity, Data structures for managing datasets and results*).

- **Motor control System with a protection circuit./Australian client.**

  Description: A system communicates with the PC by JSON Protocol to Send MFC that specifies the speed of the motor and Receives real-time Periodic JSON reports with (Current, Voltage, and Power) Values.

  Technology:*(Atmega8-Microcontroller, C lang, Eclipse, JSON encoder and decoder for motor configuration parameters, UART driver for sending/receiving JSON report, ADC driver to monitor motor parameters and report it periodically through UART interface).*

There are other projects on my GitHub: https://bit.ly/2Wr6wHy

Site Maintenance Engineer at Alkan Telecom, 2016-2017

Military service, Military call-ups, 2014-2016

EDUCATION | CREDENTIALS

B.SC. Degree in Electronics & Communication Engineering, Delta Higher Institute for Engineering & Technology, Mansoura, Egypt 2009 - 2013

- **Grade**: Very good with honors.

The Graduation Project: Smart Wheelchair.

- Wheelchair Controlled Remotely by Android App via WIFI for carrying disabled people.
- *Technologies*:(*Layout PCB for Motor and Camera circuits, Socket Software Desktop Program as User interface, TCP/UDP IP Module Driver as Wheelchair Interface to receive moving parameters, Motor Driver to move and control Wheelchair*).
- **Grade**: Excellent.

TECHNICAL SKILLS

- **Programming Languages**: Assembly, C, C++(98,11,14,17), Java, Embedded C, Bash Script, Python, Golang.
- **Operating Systems (GPOS)/RTOS**: Windows, GNU/Linux, RTOS Concepts: (VxWorks, FreeRTOS, µC/OS).
- **Embedded System Concepts**: IO_ports, Interrupts, Timers, ADC, DAC, USART, SPI, I2C, Keypad and LCD, MISRA-Rule, CAN, LIN.
- **Microcontrollers/ Microprocessors**: AVR, PIC, TI TM4C123G, ARM Cortex M4 Core Development Boards.
- **Tools**: Eclipse, Mplab, MicroC, NetBeans, VScode, Proteus, Matlab, Git, Jira, Jenkins, Docker.
- **Software Engineering**: Waterfall Model, V-Model, Agile Scrum.
- **Software Concept**: Data Structures and Algorithms, Patterns, OOP, UML, JSON, SOLID Principle
- **Database**: SQL, MySQL, Sqlite3_database
- **Embedded Linux**: Yocto, UNIX/Linux System Programming, Device Drivers, cross-tool-ng, *BusyBox, systemD, SystemV,* Qemu.
- **Others:** Socket programming, multithreading, Qt QML, IPC, Cmake, GNU Makefile, Autosar Introduction.

CERTIFICATIONS & LICENSES

- AUTOMOTIVE & ELECTRONIC IP by EITESAL NGO Awarded 12/2023.
- Intro to AUTOSAR Awarded 05/2023.
- Embedded Software and Hardware Architecture by the University of Colorado Boulder on Coursera, Awarded 10/2018.
- Introduction to Embedded Systems Software and Development Environments on Coursera, Awarded 02/2018.
- Wireless Communications for Everybody by Yonsei University on Coursera, Awarded 11/2017.
- Embedded Hardware and Operating Systems by EIT Digital on Coursera, Awarded 05/2017.
- Embedded Diploma, Instructor: Eng. Mohammed Tarek, Awarded 03/2016
- Mobile Communication: GSM, UMTS, LTE on Jelecom Training Company, Awarded 09/2012.
- Microcontroller Advanced Course. level-1 at Telecom Training Company.

VOLUNTEERISM / COMMUNITY LEADERSHIP

- **Co-Founder of ITS** (Information Technology Self-study) initiative to spread technology education by providing necessary tools and educational resources.
- Created open courseware for software development Track, OpenSource Track, mobile App Track, GIS Track, Java Track, Softskills, and English Track.

References are furnished upon request.