Hussein Abdulreda

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Desired position: Computer scientist & computer engineer

Personal data

Born: 23.04.1991 / Beirut
Marital status: Single
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Curriculum vitae

Objective

With an extended academic and professional background in all areas of computer science and computer engineering, I am looking forward to a position where I can put this knowledge and skills into practice and further develop my technical expertise.

KNOWLEDGE

- Several years of professional experience as a programmer in (C, C++, C#, ASP.NET, Delphi, Pascal, Java, JavaScript, and Python)
- Design pattern knowledge (Singleton / Factory / Builder / Dependency Injection / Decorator ...)
- CUDA (GPU) programming to kernels with different optimization techniques (Algorithmic, Shared memory, Tiling, Kernel Launch, ...) & performance issues avoiding (Memory coalescing, Divergent branching, ...) [C/C++]
- MPI (HPC) programming using multiple MPI communication modes, with the understanding of DATA-Parallel Training (Hybrid [DATA/PIPELINE] Parallelism) [C/C++]
- Advanced knowledge as a web developer full-stack (Html5 / CSS / JavaScript - TypeScript) including React Framework, Node.js / .Net Core / FastAPI and Uvicorn
- Experienced knowledge in .NET Framework (C#), Android (Java), mORMot Framework (Pascal, Delphi), and Arduino (C, C++)
- Experience in dealing with IOT platforms & machine learning in Azure Cloud & Google Cloud
- Experience with the Docker environment (Docker-Compose / Kubernetes / Docker API) microservices, Git environment
- Knowledge as database engineer {Database management system (Microsoft SQL / MySQL / Firebird)} (Queries / Stored Procedures / View)
- Experience with (Fast Reports / Crystal Reports)
- Specialized experience in object recognition, image processing, segmentation, stitching, panorama, ... [RANSAC, DSAC]
- Embedded Machine Learning (Pruning, & Quantization) [CMSIS-NN & PyTorch]
- Deep Learning Know-How (LLMs / Neural Network Architecture / NLP Transformers / GANs / Reinforcement Learning / ...)
- Advanced knowledge in the field of algorithms and data structures.
- Experience as Network Engineer in {VM Server (ESXI) & Hyper-V, Exchange Servers, Veeam Backup & Replica Server, Citrix Deployment, Thin Client, Exchange Server, SQL Server, Active Directory and Domain Controller Management}
- Digital Hardware Verification [Creating an RTL code for matrix multiplication where several design patterns were considered - including: Control (FSM,...) / Storage (Simple & Dual port RAM, ...) / Compute (MAC, ...) / Movement (DMA, ...) / Adapter (CDC , ...) - and UVM was used for randomized verifications] [SystemVerilog]
- Reconfigurable embedded system with FPGA skills and good understanding of RISC-V & various communication protocols (UART, I2C, I2s, ...)
- Yocto OS build and Linux device driver between user space and kernel space, and good experience with Device Tree Source (DTS)
- POSIX in C and C++ programming (PThreads Shared Memory / IPC / ...)

PROFESSIONAL CAREER

Aditec GmbH (R&D in department) **01/2020 – till now**
Software developer in C#.NET, Pascal, Delphi, web developer (Javascript/REACT), Linux driver, Linux device tree, Codesys, microservices (Docker)

Metropolitan (R&D in department) **01/2016 – 06/2018**
Systems Engineer & Web Developer in the ETS department

Lebanese University (State University) **01/2012 – 03/2015**
Project engineer for server networks

Languages

English: fluent, Speech & Writing
Deutsch: Very good knowledge (B2)

EDUCATIONAL PATH

BSc. Computer science
Lebanese International University, Beirut **06/2013**

MSc. Data and Computer science
Heidelberg University, Heidelberg **06/2025**

PROJECTS

- Digital Semicustom Design Flow (Meshy ASIC [65 nano meter] Chip Design during a tutorial that gave me a better understanding of the genus and innovus tools from Xilinx). *With Tcl / SystemVerilog* **(as part of the MSc. at Heidelberg Uni.)**
- Reconfigurable Embedded Systems - FPGA inference model (SpeechToLed - training a model on a digital sound dataset and creating the inference of the model on the FPGA to recognize the sound input under the I2S protocol, resulting in the sound being recognized and the binary mapped led lighting up on the Basys3 Digilant FPGA). *Using VHDL* **(as part of the MSc. at Heidelberg Uni.)**
- Reconfigurable Embedded Systems - Building RISC-V CPU on FPGA with VGA connectivity and UART protocol - resulting in a small interactive computer that performs and displays functions on the screen, such as a console with the data sent to the UART I/O. *Using VHDL / Assembly* **(as part of the MSc. at Heidelberg Uni.)**
- Creating a RAG System in NLPT course project where have built up the system pipeline around PubMed database of biomedical literature with the following approach [Data Acquisition (Pubmed API, EDirect Fetch, Crawler), Data Preprocessing, Data Storage (Pinecone/FaunaDB, OpenSearch), Data Retrieval (Chunking/Embeddings {e5-base-V2, Voyage-2-large, Text-embedding-3-large, PubMedBERT, RoBERTa}), Retrieval (Dense Retrieval, Sparse Retrieval, Hybrid Search) {RecursiveCharacterTextSplitter, TF-IDF}, Evaluating pipeline]. *Using Langchain, HuggingFace, OpenSearch, Uvicorn, REACT*, {**DEMO**} **(as part of the MSc. at Heidelberg Uni.)**
- Embedded machine learning (creating a traffic sign recognition using quantisation/pruning techniques and then retraining, giving us granular weights for the model that are better suited to the embedded device). *Using PyTorch (Python)* **(as part of the MSc. at Heidelberg Uni.)**
- Essential Machine Learning (Bomberman Bot - in this approach I trained a bot by using reinforcement learning models, where the technique used was PPO and Double Deep Q-Learning Networks [combination of TD-Learning with optimal Bellman equation] with a behavior summary at which the bot reached its effective state) *Using PyTorch (Python)* **(as part of the MSc. at Heidelberg Uni.)**
- Computer Vision 3D (GeoBotGuesser with Inception Model - retrieving 3D panoramas from Streetview Google API according to the panorama data retrieved by GeoGuesser API and feeding these values into the Inception Model, which recognises the inserted image where it is in the world) *Using PyTorch (Python)* **(as part of the MSc. at Heidelberg Uni.)**
- Creation of the new VisuNet12 using the microservices architecture with the MQTT communication principle PUB/SUB via specific topics and channels, where the purpose is to provide certain functions out of the box to communicate with Aditec devices via multiple protocols such as OPCUA (UA-JSON, ...) / MQTT, translate to and from ADBus protocol. *Using Docker / ASP.NET / Python / REACT(Javascript) / Pascal* **(as part of the Aditec work)**
- Android application that communicates with embedded devices via a RESTful server and returns a specific static site router (landing pages) on which the application shows a live demonstration of the received data via a webview, *With very good knowledge of Java / Android Manifest / Android functionalities* **(as part of the Aditec work)**
- Software development for embedded platforms under Linux (Yocto), RTOS. Use of the heterogeneous i.MX8 architecture. Development of device drivers and setting up boards (kernel modules). *Good knowledge of C/C++ programming*. Writing device trees. **(as part of the Aditec work)**
- Development of test software for Aditec devices using asynchronous socket communication with ADBUS protocol so that the production department can test the devices (hardware test / SD card test / software test / ...) and deliver them to the customer. *Using C# .NET Framework*. **(as part of the Aditec work)**
- Development of a barcode scanner software in *Windows CE* with CASIO DT-X200 for better product management with VisuNet software *using Webserver .Net Core RESTful Service*. **(as part of the Aditec work)**
- Development of a front-end chart system with Vanilla JS for data visualization and using a web server (mORMot) for communication via REST web callback functions with Aditec devices. **(as part of the Aditec work)**
- Further development for Aditec warehouse management system. *Using Delphi* **(as part of the Aditec work)**
- Created a GitLab version control server for local Aditec codes. **(as part of the Aditec work)**
- Development of an (IOT system) that uses Arduino with 'IFTTT applets from Google API' to perform actions. The communication between Google API and my *PHP API* is done via *JSON* for data communication with MySQL. **(as part of my studies in computer science)**
- Android application for Metropolitan. **(as part of the Metropolitan R&D work)**
- Network administrator on a project at the Lebanese University My tasks were managing group policies, security administration, Citrix system, thin client, SQL database, active directory and exchange server, virtualisation server (ESXI). **(as part of the Lebanese University work)**
- Image processing project for Lebanese license plate number; The program of *Python* and *Raspberry Pi* to recognize the plate number and segment the characters, to process the image and store the characters in the database. The use of a neural network was used here for character recognition. **(as part of the Metropolitan R&D work)**
- Creating an academic library platform with *C# (WPF)*. Connectivity to *SQL Server* was customized by *LINQ* and also some NuGet open source packages were added to the project for a better XAML design. **(as part of the degree in Computer Science)**