**Top Technical Skills for Embedded Software Engineers**

**My Curriculum**

* **C and C++ programming**
  + [Course] - Advanced C Programming Course
* **Microcontrollers, or MCUs**
  + [Course] - Mastering Microcontroller: Timers, PWM, CAN, Low Power(MCU2)
  + [Course] - STM32Fx Microcontroller Custom Bootloader Development
  + [Course] - Embedded Systems Bare-Metal Programming Ground Up
  + [Course] - ARM Cortex M MCU DMA Programming Demystified
* **Microprocessors**
* **Linux operating system**
  + [Course] - Embedded Linux Step by Step Using Beaglebone Black
  + [Course] - Linux device driver programming using BeagleBone Black
* **Software optimizations skills at the System on a Chip (SoC) level**
* **Real-time Operating Systems (RTOS)**
  + [Course] - Mastering RTOS: Hands on FreeRTOS and STM32fx with Debugging
* **Device drivers**
  + [Course] - Mastering Microcontroller and Embedded Driver Development
* **Understanding of design patterns and embedded system design patterns**
  + [Textbook] - Design Patterns for Embedded Systems in C: An Embedded Software Engineering Toolkit
* **Debugging skills**
* **Ability to work with existing code bases**
* **Assembly programming language**
  + [Course] - ARM Assembly Language From Ground Up - 1
  + [Course] - ARM Assembly Language From Ground Up - 2
* **Basic understanding of Internet of Things (IoT) and internet-based technologies**
  + [Course] - Exploring AWS IoT
* **Understanding of data structures**
  + [Practice] - Practice Problems geeksforgeeks.org
* **Python programming language**
  + <https://www.geeksforgeeks.org/python-exercises-practice-questions-and-solutions/>
* **Experience in or ability to learn communication protocols. Relevant protocols to have at least an understanding of include I2C, Serial Peripheral Interface (SPI), USB, General-purpose input/output (GPIOs), Controller Area Network (CAN bus), Recommended Standard 232 (RS232), one-wire, Recommended Standard 485 (RS485)**
* **C# Programming and GUI development with C#**
* **Radio communications 5G, LORA, Wireless, Bluetooth**
* **Embedded Systems Design**
  + [Course] Embedded System Design using UML State Machines