Mahmubul Hoque

Mechatronics Engineer

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Audio/Video Processing, DSP, TI, ARM Processors, Optimization, End to End, Bootloading, Drivers

Skill Summary

* *Languages*: C, C++, Python
* *Technology*: Linux, IAR Compiler, TensorFlow, Matlab/Simulink, LabView, Git, CANalyzer
* *Communication Protocols*: SPI, I2C, UART, USB, CAN, LIN Bluetooth, WLAN, Zigbee
* *Bench Equipment*: Oscilloscope, DMM, PSU, Logic Analyzer, Soldering Iron, JTAG Debugger
* *CAD*: Spice, Cadence, Altium, Eagle, OrCAD, Catia, Solidworks

HW SW bringup, cross functional teams, RF/Analog, VLSI/RTL design, Emulation, Simulation, Diagnostics, Memory dump

Work Experience

**RMF Design** | **Hardware/Firmware Engineer** May 2018 - Present

* Rapid prototyping, design, and validation testing of medical, automotive, and commercial products
* Mixed Signal, multi-layer, high density board design for high transient, high speed systems
* Firmware development in C on 8/16/32-bit µC and SoCs; ARM, bare metal, RTOS
* Update µC and SoC power management logic and GPIO power rail controls
* Circuit analysis/simulation, sensor implementation, and DSP/Signal integrity

**Tesla** | **Prototype Engineer** August 2016 - January 2017

* Rapid prototype development of test harnesses for EV systems within Model 3 and Tesla Truck
* Design boards to interface with high voltage actuators, VFDs, and various sensors/transducers
* LabView programming, interfacing with DAQ systems, and implementing DSP
* 3D CAD in Catia for mechanical design and analysis
* Script data collection with Matlab and design state-space/PID control systems in Simulink

Optical, Camera, hands-on, DC/DC power, Radio,

Projects

**Vehicle Compression System**

* Develop external temperature management system for automotive vehicles
* Implement CAN/LIN networks to communicate with vehicle ECU and private peripherals
* Design automotive rated board; isolated from chassis, ESD/load-dump protected
* Interface with sensors, implement circuits to filter conductive/EMI noise and anti-aliasing
* Design 48V, 55A BLDC driver; 3x bridge driver, low Rds FETs, current feedback, UVLO, deadtime
* Develop lean, bare metal firmware on STM µC; build custom drivers due to constrained code space
* Validate design through comprehensive tests to ensure field compatible with multiple vehicles

**Smart Lock System**

* Develop Raspberry Pi based automated door lock to eliminate need for peripherals
* Render enclosure in Solidworks and optimised via mech analysis; FEA, thermal, impulse
* Develop firmware for ATMega chip to interface with stepper motor and various sensor inputs
* Write automation scripts in Python for facial and voice recognition

**Virtual Fitting** [https://youtu.be/Z5dfei719XU]

* Develop prototype to eliminate fitting issues and facilitate online clothes shopping
* Hardware lead; implemented Xbox Kinect system and designed the PDU with CSA approval

Education

**University of Waterloo**: Bachelor of Applied Science, 2018

Honours Mechatronics Engineering (GPA: 3.5)

Interests

* Badminton
* Travelling