Mahmubul Hoque

Mechatronics Engineer

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Skill Summary

* *Languages*: C, C++, Python
* *Technology*: Linux, IAR Compiler, TensorFlow, Matlab/Simulink, LabView, Git, CANalyzer
* *Communication Protocols*: SPI, I2C, UART, USB, I2S, CAN, LIN
* *Bench Equipment*: Oscilloscope, DMM, PSU, Logic Analyzer, Soldering Iron
* *CAD*: Spice, Cadence, Altium, Eagle, OrCAD, Catia, Solidworks

Work Experience

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

* Rapid prototyping and design validation of medical, automotive, and commercial products
* Mixed Signal, multi-layer board design for high transient, high speed systems
* Develop firmware on 8/16/32-bit MCUs and SoCs; bare metal, RTOS
* Circuit analysis/simulation and analog/digital signal processing

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

* Develop test harnesses for EV systems used within Model 3 and Tesla Truck
* Design boards to interface with high voltage actuators, VFDs, and various sensors/transducers
* Implement state-space/PID control methods utilizing LabView for high speed parallel processing
* Script data collection with Matlab and design systems in Simulink

Projects

**Vehicle Compression System**

* Communicate with vehicle ECU over CAN/LIN and support AC without draining main battery
* Design automotive rated board; isolated from chassis, ESD/load-dump protected
* Interface with sensors, using digital/analog signal processing to filter conductive/EMI noise
* Design H-bridge for 48V, 55A BLDC with gate drivers, low Rds FETs, high-speed parallel interface
* Develop lean firmware on Renesas chip; use low level/custom drivers due to constrained code space
* Validate design through comprehensive test to ensure field compatible with multiple trucks

**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
* Design product enclosure, considering mass/thermal distribution and consumer aesthetics
* Script in C# to overlay clothes onto Blender generated human avatar using AR

Education

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

Honours Mechatronics Engineering (GPA: 3.5)

Interests

* Badminton
* Travelling