Mahmubul Hoque

Mechatronics Engineer

Email: MahmubulH@Gmail.com
Website: https://mahmubulh.github.io
Phone: (289) 689-5649

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/EMC 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