Tilak Gupta

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Education

Mechatronics Engineering, University of Waterloo (85% Average) Sep 2015 - Present

- Relevant Courses: Microprocessor Systems, Actuators and Power Electronics, Embedded Systems (edX), Neural Networks and ML (U of T)

Skills

Firmware

Embedded C/C++ | Python | Bash | FreeRTOS | Bare Metal | GNU ARM Toolchain | OpenOCD | Git | UART, SPI, I2C, CAN | PWM | uVision | CubeMX | IAR Emb. Workbench | Visual Studio

Hardware

ARM | STM32 | DMM | Oscilloscope | Power Supplies/Wave Generators | Particle Core | Arduino | IoT | Altium (Learning) | Circuit Design | Schematics | Soldering Surface Mounts | Hardware Debugging

Work Experience

Embedded Developer, ecobee Jan – Apr 2018

- Programmed a modified 3D printer to conduct prototype-LCD touch testing using Marlin and Python
- Developed initialization code for LCDs by configuring register values using SPI – within Linux kernel
- Wrote python scripts to transfer a large SQL database to MongoDB
- Aided in prototyping AES encryption between ecobee's smart devices

Control Systems Design Assistant, MedAvail Technologies Inc. May – Aug 2017

- Developed a bootloader capable of recovering firmware from external memory for prototype machines
- Designed and tested an API to transmit node firmware over CAN during node updates
- Ported code running in TI-RTOS to FreeRTOS on STM32 MCUs
- Debugged hardware issues arising from CAN and SPI using oscilloscopes and CAN analyzers

Software Engineer, BDO Solutions Ltd Sep – Dec 2016

- Decreased web application load times by 50% by redesigning application in different software
- Increased web security by enforcing HTTPS and preventing Cross Site Scripting attacks
- Performed propensity modelling and regression analysis to predict insurance claims

Extra-curricular Experience

Waterloo Formula Electric, Firmware Team, University of Waterloo Jan – Dec 2017

- Setup SPI communication with SD card for logging sensor values, benchmarked R/W speeds
- Developed firmware for 2018 vehicle Data Acquisition Unit

Projects

Electric Carbon Fiber Bike (WIP, Construction Pending)

- Designed a full size carbon fiber bike frame and planned electrical propulsion system
- Planning to design a custom in-house motor control unit to control BLDC motor
- Designed a custom mono-shock rear suspension for off-road capability

LED Ambient Lighting

- Used the Particle Core to program LEDs to respond to weather and music
- Wrote firmware to transfer LED color commands using custom serial communication protocol

Quadcopter

- Built a quadcopter utilizing online resources and sourced parts (Frame, Motors, ESCs)
- Debugged hardware and firmware issues which arose during the build

Awards

- Waterloo President's Scholarship | $2,000
- Vex Robotics: Excellence in Design | Rick Hansen Regional Winner Out of 36 teams