SURAJ THITE

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EDUCATION

University of Colorado, Boulder ***May 2021***

Master of Science in Electrical Engineering (Specialization in Embedded Systems and IoT Firmware Design) *3.85/4*

Courses: ECEN 5813 - Principles of Embedded Software, ECEN 5823 - IoT Embedded Firmware Design, ECEN 5013 - Advanced Embedded Software Development, ECEN 5623 Real-Time Embedded Systems, ECEN 5122 Wireless Local Area Networks.

SKILLS

- Languages: C, C++, Python, Bash, Embedded C.
- Protocols: I2C, SPI, TCP/IP, UDP, MQTT, BLE.
- Design/Dev Tools: Keil, MCU Expresso, Simplicity Studio, CCS, AVR-Studio, Git, Wire Shark, FreeRTOS, Yocto, Build root.
- Operating Systems: Linux (Debian), Windows.

PROFESSIONAL EXPERIENCE

Larsen and Toubro Ltd, Mumbai, India

Sr. Systems Design and Integration Engineer ***Jul 2017 - Jul 2019***

- Designed cloud enabled IPV6 based narrow band mesh technology solution for Smart Electrical Meters. *Indore, India*
- Tested and commissioned Building Automation and Control System (BACS). *Qatar Rail, Qatar*
- Implemented PID control model across the gas line along with its logic design and SCADA development. *Tatweer, Bahrain*
- Designed GSM based RTU system to transmit Pressure and Temperature variables from in plant transmitters. *OGC, Oman*

Department of Remote Handling and Robotics, BARC-Mumbai ***Dec 2015 - Jan 2016***

Research and Project Trainee

- Designed Servo drive models and studied its response for implementing haptic feedback for tele-robotic manipulators.
- Transmitted feedback data Implementing Interoperable Teleoperation Protocol wrapped in low overhead UDP packet.

Department of Radiation Detection and Instrumentation, BARC-Mumbai ***Jun 2014 - Jul 2014***

Research and Project Trainee

- Developed embedded firmware for gamma – radiation detector using TI – MSP 430 controller.
- Electrical pulses were calibrated in Sievert scale implementing on-board JTAG interface.
- Developed data logging system for the radiation detected at specific intervals implementing onboard RTC unit.

ACADEMIC PROJECTS

Bluetooth Low Energy based Temperature Monitoring System ***Sept 2019 – Dec 2019***

- Acquired temperature data from Si7201 sensor over I2C bus on server and catered gatt-characteristic services to the client.
- Implemented state machine model for load power management while reading the data from the sensor at regular intervals.
- Effectuated deep sleep states and low energy timer, thus reducing average current consumed by the system by 200%.
- Implemented secured encrypted client-server link and adapted transmission power of the server w.r.t received RSSI values.

Embedded Signal Generator and Analyzer implementing FreeRTOS ***Sept 2019 – Dec 2019***

- Generated waveforms with varying range and time period using lookup table, achieving 70% reduction in computation time.
- Implemented DMA transfer from ADC buffer to memory using task scheduling while printing DSP report on serial interface.
- Exploited xQueuing feature in FreeRTOS to create DSP buffer along with semaphores and mutexes for task synchronization.
- Developed bare-metal drivers for SPI, ADC, DAC, I2C and DMA along with tabular state machine model for FreeRTOS tasks.

Self-Stabilizing Platform ***Jul 2016 - Apr 2017***

- Sensor Fusion of accelerometer and gyroscope to yield real time yaw, pitch, roll of the platform via I2C interface.
- Compensated random drifts in time varying mean samples of the sensor implementing Kalman Filter.
- Implemented PID control for error correction of real-time yaw, pitch and roll values.
- Implemented serial link for 3D simulation of the platform and graphical analysis of the model using processing software.

AVR Based Oscilloscope ***Jan 2016 - Mar 2016***

- Implemented AVR ATMEGA 32 controller along with GLCD screen to display waveforms of input electrical signals.
- Designed amplifier and low pass filter for the input signal while feeding its output to ADC pin of the micro-controller.
- Provided the provision of compressing or expanding of the signal along time axis along with representation of real-time frequency and amplitude of input signal by the means of push button switches.

Robotic Hotel Management System – *EYANTRA Robotic Competition -2016* ***Mar 2016 - Nov 2016***

- Designed autonomous hotel management system to serve 4 rooms depending on service demanded.
- Implemented line following algorithm for navigation and 3 DOF robotic arm for collecting and dumping of objects.
- Detected color using TCS3200 color sensor and segregated waste using designed robotic arm.
- Implemented autonomous robot navigation of corners with uncertain sensor information via fuzzy control.

WORKSHOPS AND CERTIFICATIONS

- Raspberry Pi Platform and Python Programming using Raspberry Pi – University of California, Irvine through Coursera.
- Interfacing with Raspberry Pi - University of California, Irvine through Coursera.
- Programming for Everybody (Getting Started with Python)- University of Michigan through Coursera.
- Python Data Structures – University of Michigan through Coursera.