Justin Turcotte

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Summary: I am a (B.Eng.) Embedded Systems/Electronics Engineering student looking to apply proficient technical and interpersonal skills in a meaningful position upon graduation of my degree program at the end of August 2021.

SKILLS / RELATED INTERESTS

- C/C++, Python
- HTML, XML, CSS, PHP, JavaScript
- Linux, QNX
- Solidworks, FreeCAD
- Multisim, Altium

- Multi-tasking
- Flexible
- Quick-Learner
- Organized
- Punctual

PROJECTS

JANUARY 2021 – AUGUST 2021
CAPSTONE PROJECT – DIGITAL RECEIPTS

- For our Capstone project (culminating project of the program), my team decided to come up with a method of replacing paper receipts with a digital copy that's easy to obtain.
- We designed a system that will use NFC to transmit receipts from the POS (Point of Sale) Systems to the customers mobile device.
- Setup a virtual network PDF printer on a Raspberry Pi, the destination of the POS receipts.
- Implemented a Python script that will manage the receipts sent to the Pi and, depending on the position of a switch, print the receipt to a USB thermal printer, or forward the receipt to an NFC device which will handle transfer to the mobile phone.

MAY 2021 – AUGUST 2021
ANTI-NAIL-BITING PROJECT

- In a group, designed a system that would deter the user from biting their nails.
- A necklace-like device is worn around the neck. Using an ultrasonic sensor in the front, the hand is detected as it approaches the mouth. Vibration actuator at the back of the neck vibrates when the hand is detected.
- Designed a circuit to utilize the vibration actuator while considering limitations of the micro-controller.
- Implemented software on an Adafruit Feather Express NRF52840 micro-controller that will enable or disable the vibration actuator based on a button input.
- Will implement software to read the ultrasonic sensor, and based on result, turn on and off the vibration actuator.

EDUCATION

SEPTEMBER 2017 – AUGUST 2020
BACHELOR OF ELECTRONIC SYSTEMS ENGINEERING

CONESTOGA COLLEGE – DEGREE PROGRAM, GPA: 3.8
CORE CLASSES

- Computer Architecture, Software Engineering, Embedded Systems Hardware
- Advanced Topics in Mathematics, Electronics, Electromagnetism
- Telecommunications & Signal Processing, Wireless Communications & Signal Processing, Data Communications & Networks

EXPERIENCE

JANUARY 2020 – APRIL 2020
PRODUCT ENGINEERING INTERN, SERA4
- Quality control, testing & configuration of products being sent to customers.
  - Placed appropriate components (soldering) on products to set them to a specific configuration as wanted by the customer.
- Research & testing of padlocks in cold environments: experimented with different methods of improving reliability of padlocks in cold environments.
  - Tested vinyl-covers, Vaseline, bags, WD40.
  - Documented results with photos & observations.
- Investigated a driver that was not limiting current as specified, despite steps in the datasheet, current limiting did not occur at the required value.
  - Occasionally, thermal shutdown would occur which caused confusion initially.

JANUARY 2020 – APRIL 2020
SOFTWARE DEVELOPMENT STUDENT, BLACKBERRY
- Integrated an external sensor into the QNX Sensor Framework.
- Configured a Nucleo-F767ZI to run FreeRTOS.
- Using a mouse as a test sensor, the Nucleo device read the mouse data & forward the data to the Nucleo who would then forward the data to the QNX Sensor Framework.
- Modified Sensor Framework to add support to a resource manager (QNX driver), which would act as a TCP client.
- Nucleo setup as a TCP server, would listen for the QNX resource manager to connect & would stream the mouse sensor data to the QNX Sensor Framework.
- Researched Protobufs & gRPC implementation on the Nucleo device.

MAY 2019 – AUGUST 2019
SOFTWARE DEVELOPMENT STUDENT – OS CORE, BLACKBERRY
- Created recipes and patches in Yocto to contribute to a custom Raspberry Pi 3/3B+ build for endpoint IoT devices:
  - Modified Dash and Korn shell source code to secure directories and reject unauthorized input.
    - Such as piping scripts into the shells and running scripts in an unprotected location.
  - Modified bootup services to solve various bugs in the Yocto build.
- Worked with a Nucleo-STM32F767ZI and FreeRTOS:
  - Configured MQTT communications between the Nucleo and a Raspberry Pi 3B+.
  - Implemented an XML parser to parse over the air XML instructions for permissions of IoT end-point devices.
- Assisting Cylance with expanding compatibility of their software to multiple Linux distros and flavors.
  - Created a Python script to ping Ubuntu's kernel mapping site and retrieve all kernel versions with their distro and flavor into a text document.

COMPETITIONS

MARCH 2019
AI FOR GOOD HACKATHON, GEEKSPEAK COMMERCE
- Utilized machine learning to identify basic facial emotions of individuals such as happy, sad, angry
- Used Microsoft Azure Custom Vision to create a model for identifying emotions

NOVEMBER 2018
JUNIOR ENGINEERS COMPETITION, CONESTOGA COLLEGE ENGINEERING SOCIETY
- Participated in a team of 4 to design and implement a device that would scoop water from one location and deposit it in a desired destination with limited spillage.
- Limited materials (flat/cylinder cardboard, plastic tubing, string, tape), budget, & time limit (3 hours)