Eva **Esteban**

Software Engineer

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Experience

Apple

One Apple Park Way, Cupertino, California, 95014, US

Software Prototype Engineer — *06/03/2024 - PRESENT*

- R&D for Vision Products Group.

OpenBCI

67 West St, Ste 612, Brooklyn, New York, 11222, US

Computer Systems Engineer — *10/01/2020 - 05/24/2024*

- Architecting, developing, and debugging firmware and software for wearable systems that communicate wirelessly. Most recent example is a VR headset with time-locked integration of EEG, EMG, EDA, PPG, and eye-tracking sensors.
- Using state-of-the-art MCUs with communication protocols I2C, SPI, UART and SDIO. Utilizing C/C++, RTOS, Java, and Python for system development and unit testing.
- Prototyping and optimizing adaptive VR applications for demos and research experiments with Unity, C#, and Java based on sensor data. Using protocols such as LSL, TCP and UDP for data transfer between applications.
- Leading junior engineering recruitment and establishing strategic partnerships with major corporations like Lenovo and Formlabs.
- Awarded the 2023 Emerging Technologist prize at the Grace Hopper Celebration by AnitaB.org.

Computer Engineering Intern — *07/01/2020 - 10/01/2020*

- Developed a system to control the computer keyboard via BLE 4.0 using EMG signals.
- Worked on an EEG-based light automation system using Python, C#, Java and brainflow.

Cornell Tech

2 West Loop Rd, New York, New York, 10044, US

Robotics Intern — *05/27/2020 - 06/30/2020*

- Worked in a multidisciplinary team to prototype, develop and test an autonomous trash-picking robot using a Turtlebot3 Waffle Pi.
- Implemented path-planning, maze-solving and SLAM algorithms utilizing ROS, C/C++, Python, Gazebo, RViz and MoveIT in Linux.

General Electric Healthcare

Pollards Wood, Nightingales Lane, Chalfont St Giles, HP8 4SP, UK

EID Software Engineering Intern — *07/31/2017 - 08/24/2018*

- Presented neurology work "Identification of FTD Candidates in MCI-SNAP Groups by Cortical Thickness Analysis" at the 2018 AAIC and EANM Conferences.
- Architected, developed and documented a tool to mask patient information in DICOM images using C#, Model-View-ViewModel (MVVM), Test Driven Development (TDD), unit testing, Git and .NET.
- Developed VR applications to train medical professionals using C++ and Unreal Engine 4, presenting at events such as the Imperial College London Careers Fair.
- Completed "Neuroanatomy for Imagers" research course at King's College London, gaining knowledge on the human brain.
- Gained 5 General Electric Impact Awards.
- Led SCRUM software development workshops for young students as a STEM Ambassador and GirlsGetSET volunteer.

Education

Cornell Tech at Cornell University

New York, US

Master of Engineering in Electrical and Computer Engineering — *Aug 2019 - May 2020*

- GPA 4.07/4.3.
- Merit Scholarship.
- Student Spotlight.

University of Surrey

Surrey, UK

Bachelor of Engineering in Electronic Engineering with Computer Systems — *Sep. 2015 - July 2019*

- GPA: 4.0/4.0.
- Graduated with First Class Honours.
- Student of the Year 2019 HC.
- Surrey's Top Achievers Recognised and Supported (STARS) 2016 and 2017 awards.
- BAE Systems Applied Intelligence Prize finalist.

Projects

Bluetooth Low Energy Light Sensor

Project Link

- Designed, developed and tested a low-power wearable sensor that records the intensity of light at different wavelengths and the temperature. It sends this data together with user input via Bluetooth Low Energy (BLE 4.0) to an Android mobile application and stores it in a MySQL database. The PCB was designed using Eagle, the sensor communication established over I2C, and the Bluetooth module communication over UART. The code was written in C/C++ running on an ATMega328P, the application in Java, and the transmission scripts in PHP.

Mind-Controlled Wheelchair

Project Link

- Developed a prototype for an EEG-controlled wheel for a wheelchair to aid paralyzed individuals. The code was written in C/C++ running on an ATMega328P.

Computer Tank Maze Game

Project Link

- Developed a computer game using OpenGL, C++ and Python where the player drives a tank to collect tokens in a maze within a time limit. Implemented collision detection, shading and sound effects.

FM Receiver

Project Link

- Developed an FM radio receiver using an FM chip (AR1010) and an audio amplifier (TDA2822). The FM receiver was controlled using a PIC and the code was written in Assembly.

EEG Meditation Tracker

Project Link

- Developed a prototype that uses EEG data to calculate how long a user's mental relaxation streaks are and display their highest score of the day. The code was written in C++ running on an Arduino.

Gesture Recognition System

Project Link

- Trained Hidden Markov Models (HMMs) in Python to identify 6 different arm motion gestures in real time. The data used to train the models were readings from an IMU.

Chair Posture Tracker

Project Link

- Developed a device that measures, logs and displays the percentage of time that you spend sitting incorrectly. The sensor data was collected via I2C and logged in an EEPROM. The code written in C/C++.

ASIC for Music Synthesizer

Project Link

- Designed the ASIC for the amplitude envelope section of a virtual analog music synthesizer. The code was written in Verilog and Matlab. The simulations were performed in ModelSim.

Reinforcement Learning

Project Link

- Implemented RL algorithms in Python such as Policy Iteration, Q-Learning and REINFORCE to solve OpenAI Gym environments.

Neural Network for Speech Denoising

Project Link

- Trained a neural network using Matlab to identify and remove background noise from speech signals with a Mean Square Error (MSE) of 0.0029. The training data was preprocessed using signal transforms such as DCT and STFT.

Image Search Engine

Project Link

- Built a computer vision image search engine to retrieve images from a database similar to an input image query. The tool was developed and tested using Matlab.

Fall Detection Wearable

Project Link

- Built a low-cost Bluetooth Low Energy (BLE 4.0) enabled wearable device designed for the elderly population. The device detects a fall and alerts an emergency contact via SMS messaging. The PCB was designed using Eagle. The sensor communication was established over SPI and the Bluetooth module over UART, the code was written in C/C++ and the Android application in Java.