Personal information

Surname / First name | **Silva, Matias**

Telephone | +44 07384 411982

E-mail | mw781@cam.ac.uk

Education and training

From October 2019 to 2023

University of Cambridge, Girton College

MEng Engineering, on track to a 1

Course covers mathematical methods and electrical and information engineering including:

- physical principles of electronics, analysis of circuits and devices, linear circuits, electromagnetics, digital circuits and information processing
- mathematics and computing

Examples of coursework (done in groups of 2) include:

- the integrated electrical project (IEP) – designing and simulating circuits with LTSpice, building and testing different blocks of an AM radio using a Picoscope and a signal generator. The main challenge was tweaking the self-made inductor to achieve resonance at the desired frequency**.**
- the structural design project (SDP) – sketching out orthographic and isometric prints for an aluminum bridge and later building it. Problem solving involved sourcing and bending custom sheet metal components to reinforce the structure and in the end my group was the only capable of withstanding a load of 8kN.
- Computing and numerical analysis with Python through structured self-learning activities involving practical engineering problems and numerical integration

Obtained beginner French certificate at the engineering Center for Languages and Inter-communication

From 2016 to 2019

Carlucci American International School of Lisbon
IB Diploma Programme candidate (Years 12-13)
American High School Diploma Candidate
Year 11 2016-2017

Achieved final grade of 45 points in the International Baccalaureate May 2019 Examinations

Graduated Top Scholar of Carlucci AIS Lisbon

Experience

Courses and internships

Internship at PragmatIC Cambridge in developing extended APIs for an ARM Realtek chip (2020)

- Developed a bespoke interface for setting hardware registers, configuring decode algorithm variables and polling for RFID tag reads via UART
- Architectured an API and implemented it on an Espressif ESP-32 using the ESP-IDF and FreeRTOS tasks to listen to incoming data, dispatch commands to queues and process data according to its type

Given full scholarship to attend Columbia University's (New York) summer immersion program in *"Investigations in Theoretical and Experimental Physics" (2018)*

Internship at Celfinet Portugal for exploration of LoRa wireless technology system (2018)

- Built, designed and coded base-station and receiver system to transmit data
- Integrated an SD card and display to monitor signal strength to determine the real-life feasilbility of the technology in a "smart" garage

Projects
2017- 2020

Assembled a video conferencing platform for my university during COVID-19 used by hundreds of staff and students

- Given award for my work by the Cambridge University Center for Teaching and Learning
- Built custom Ansible playbooks for consistent and on-demand deployment of BigBlueButton servers, used Xen for management of virtual machines, designed a bespoke recording workflow
- Developed a web application to interface with the BigBlueButton API – was used to host the virtual freshers' fair and several college-level fairs

Contributor to the BigBlueButton free, open-source video conferencing project

Licensed beginner and intermediate radio amateur from Radio Society of Great Britain. Member of Cambridge University Wireless Society undertaking training for advanced level exams.

- Training includes the operation of transceivers, understanding of radio transmission, construction of own radio kit
- Aim is to achieve an amateur radio license and callsign to be used globally

Home automation based on self-learned knowledge of electronics, Arduino, Raspberry Pi and a variety of sensors

- Using Node-RED flows with relays to program an energy-friendly heater that turned on at specific times, allowing me to wake up at a comfortable temperature
- Using insulated DS18B20 sensors to log exterior and interior temperature and humidity levels in a relational database to monitor temperature variations in Lisbon over one year

Team leader of European Space Agency AstroPi project at CoderDojo LX and Futurix

- Wrote Python code that creatively displayed accelerometer and gyroscope data to astronauts on the ISS on custom ESA Raspberry Pi kits
- Coordinated amongst a team of 10 volunteers on two similar projects

Programming of complex games such as Simon Says and "Catch" in JavaScript using graphics and physics libraries (p5.js and matter.js) to track highest scores using Firebase "database as a service" in real-time

Application of electronics and software knowledge to devise a physics experiment relating the emitted luminous intensity of a laser and the resistance of a photoresistor

Additional information

Languages

English, Portuguese, Spanish (fluent), Mandarin (intermediate), French (lower intermediate)

Technical skills

- Embedded systems: ESP32 and the ESP-IDF, wireless communication (LoRa, Wi-Fi, RFID, Bluetooth)
- Programming: Python, JavaScript, Java, MATLAB, C, C++
- Others: Linux system administration, web application development, CI, Git, Docker, nginx, Node
- CAD: Basic skills in SOLIDWORKS and engineering drawing gained over a semester course

Mentionable honours and awards

- Outstanding Student Contribution to Education Award from the Cambridge University Center for Teaching and Learning, signed by the Senior-Pro-Vice Chancellor for Education
- Recipient of iGEM university scholarship
- Subject excellence award (20-times recipient) in Carlucci AIS Lisbon (2017-2019)
- Recipient of National Honor Society university scholarship
- National Pi memorization record holder for Portugal (601 digits)
- *Duke of Edinburgh's silver award* achieved following an expedition to South Africa, which developed team collaboration skills in a series of nature-involved challenges (2016)

Conferences

Model United Nations

- Delegate: The Hague International MUN (2018), Colégio Internato dos Carvalhos MUN (2017), Iberian Model United Nations (IMUN) (2017), IMUN (2016)
- Officer and administrative staff leader: IMUN (2018) (400+ attendees), Junior Model United Nations Sintra (2018) (300+ attendees)

Roles

- Junior Treasurer and volunteer of CU Student-Run Computing Facility
- Secretary and webmaster for Cambridge University Portuguese Society
- Webmaster for CU SynBioSoc, CU First Aid Society
- Champion and mentor of CoderDojo LX (Lisbon, 2018-)
- Community service – weekend cook for FoodCycle in Cambridge to combat food waste
- Girton College Student Ambassador
- Leader of school Computer Science and Electronics club (2017-2019). Projects include:
  - diagnosis and repair of broken carbon dioxide sensors used in biology labs
  - designed and built a remote weather station with built-in SD card logging to keep track of temperature and humidity levels (soldering, circuit design, C++ and CAD)
- Treasurer and member of the *Vasco da Gama* Chapter of the National Honor Society (2017-2019)
- Treasurer, member, and events leader of the Student Council (during Years 8-13)