Andrés Eduardo Martínez Llorente

+44 (0)7710 463343 | andres.m.ll2003@outlook.com | linkedin.com/in/andres-martinez-llorente/

Education

Imperial College London *Oct 2021 - June 2025*

MEng Electronic and Information Engineering *London, England*

- Achieved 1st class honours
- **Relevant courses:** Real-Time Digital Signal Processing | Adaptive Signal Processing and Machine Intelligence | Topics In Large Dimensional Data Processing | Digital Systems Design
- **Additional courses:** Completed iExplore French level 4 course, certifying B2 language level.

Dartford Grammar School *Sep 2013 - May 2021*

Secondary School *Kent, England*

- **IB Diploma:** 44/45 with 7/7 in Mathematics and Computer Science HL
- **GCSE:** 9 Grade 9s, 2 grade 8s, 1 grade 7, including Mathematics (9), Computer Science (9) and Physics (9)

Music Technology Experience

Raspberry Pi Synthesizer *June 2025 - Ongoing*

- Created wavetable synthesizer written in C/C++ for Raspberry Pi.
- Implemented DSP features such as wavetables, envelopes and delay-based effects following The Audio Programming Book.
- Researched and employed popular libraries such as PortAudio for real-time audio playback and libremidi for piano keyboard input.
- Currently migrating from single-process to multi-threaded application with separate control and audio threads.
- Integrated DAC to give line output to the sound system in my room or the DJ mixer in the imperial radio studio.

Clavichord Synthesizer Algorithm *2024*

- Created real-time DSP algorithm for polyphonic synthesis of a clavichord on a Texas Instruments DSP board, written in C++.
- Modelled and tested discrete IIR filter in Simulink, based on Karplus-Strong Synthesis principles.
- Achieved multi-threading between the board's 2 CPUs using inter-process communication protocol for paralleling processing of instrument voices.
- Optimised program to meet real-time computing constraints, allowing an output sample rate of 44.1kHz.

Software and Embedded Experience

Software Engineering Internship *July 2024 - September 2024*

Roku *Cambridge*

- Worked in the TV firmware team, maintaining the linux-based Roku OS and its TV-specific hardware interfaces.
- Programmed in modern C++, consolidating concepts such as RAII and design patterns.
- Developed networked, multi-threaded testing services that interfaced with automation frameworks and TV systems.
- Carried out rigorous version control for large repository with submodules, completing formal code reviews and pushing code into production via CI/CD system.
- Confidently delivered technical presentation about my project results to Engineering VP, senior developers and fellow interns, achieving balance between accessibility and detail.

Learning-based Image Compression Using Invertible Neural Networks and Diffusion Models *Oct 2024 - June 2025*

Final Year Project *London*

- Applying wavelet-based invertible neural networks to improve the performance of existing image compression algorithms.
- Developing composite models in Python that combine well-known diffusion models, cutting-edge compression algorithms, and novel invertible neural networks.

ARM Hardware Accelerated Pathfinder *2024*

Industrial partner project *London*

- Employed hardware acceleration techniques such as parallelism to minimise runtime of shortest path algorithms developed in Verilog for intel FPGA.
- Wrote low-level C drivers for DMA module, allowing passing of large arrays directly to from memory to hardware accelerator blocks.
- Added wireless networking functionality to FPGA by interfacing it with an ESP32 using SPI protocol, using oscilloscope to debug channel.
- Demonstrated product through web application integrated with OpenStreetMaps API to solve routing problems on real-world map data.

RISC-V Processor *2022*

- Designed a pipelined RISCV processor in SystemVerilog.
- Wrote a small C++ RISC-V assembler to help translate assembly test programs into binary.
- Produced C++ testbench with optimisation for hardware platform to decrease runtime.
- Took leadership in the 4-person group and adopted industry practices like version control on GitHub repository.

Skills & Languages

Programming	Python, C/C++, Julia, embedded C, SystemVerilog/Verilog, RISC-V assembly, Java, CMake, Matlab, Simulink, Git, Scripting (Bash), LaTeX
Software	Linux, Vim, Docker, Jira
Languages	Spanish (native), English (native), French (Intermediate/B2)

Activities & Leadership

Head of Events/Webmaster for IC Radio	Coordinating various technical teams and setting up tech for music events.
Music x Code Course	Learning about audiovisual performance coding languages (TidalCycles and Hydra).