

André Pinho

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I'm a Computer Engineer with experience in Software Engineering, Digital Hardware (FPGA), Low-level Programming and Real-Time Systems. My work interests are diverse, with an inclination to the fields of Audio / Music, Security, Aeronautics / Automotive and Robotics. I've also worked in Machine Learning projects, mostly focused on the application of Deep-Learning to Text Mining and Information Retrieval.

EDUCATION

Integrated MSc in Computer and Telematics Engineering

Aveiro, PT | Sep 2015 - Feb 2021

UNIVERSITY OF AVEIRO

Extra course: Power Electronics

GPA: 18.3 / 20.0 (Highest GPA of the class)

Classical Music - Piano

Aveiro, PT | Sep 2003 - Jul 2017

MUSIC CONSERVATORY OF AVEIRO CALOUSTE GULBENKIAN

GPA: 16.0 / 20.0

Secondary Education: Sciences and Technologies

Aveiro, PT | Sep 2012 - Jul 2015

DR. MÁRIO SACRAMENTO SECONDARY SCHOOL

GPA: 17.0 / 20.0

EXPERIENCE

IEETA, UNIV. AVEIRO | RESEARCH FELLOW

Aveiro, PT | Apr 2021 - Apr 2022

- Research grant on *Ranking Scientific Publications describing Protein Interactions affected by Genetic Variants*
- Focused on the study and application of BERT-based models (novel Transformer Deep Learning architecture for Natural Language Processing) in Information Retrieval tasks for Bioinformatics
- In addition to the main research goals, I also participated (with two colleagues and a teacher) in the BioASQ22 challenge, resulting in one published paper [1] and one award

IEETA, UNIV. AVEIRO | RESEARCH FELLOW

Aveiro, PT | May 2019 - Nov 2019

- Research grant on *Computer Vision for Mobile Robotics*
- Collaborated on improving, fixing bugs and migrating the platform of the robotic vision on the CAMBADA autonomous soccer robots team

IT, UNIV. AVEIRO | RESEARCH FELLOW

Aveiro, PT | Mar 2018 - Mar 2019

- Research grant on *Development and integration of Modified Nodal Analysis on a Circuit Solver*
- Created a system capable of parsing SPICE netlists and solving them on a DC, AC and Transient domains using Modified Nodal Analysis. Was made to be part of an eco-system focused on teaching Analog Circuit Analysis
- This project was presented at CNaPPES'18 (paper [2]) and at IEEE SYP'18 (workshop)

IEETA, UNIV. AVEIRO | RESEARCH FELLOW

Aveiro, PT | Jul 2017 - Jan 2018

- Research grant on *Unmanned Aerial Vehicle Flight Maneuvers*
- Exploration of the internal communication protocols, telemetry and mission planning of a hexacopter drone

AWARDS

2022 2nd place in a category of the BioASQ22 challenge (Task 10B, Phase A, Batch 5)

2021 Merit scholarship awarded by the Portuguese Government (Top 26 of >15.000 students [top <0.17%] on year 2019/2020 of University of Aveiro)

2020 3rd place (out of 19) on the Think Twice Hackathon contest (teams of 3)

2016 Best Digital Systems Laboratory student (out of >80) award, with a FPGA board as a prize

2016 2nd place on the senior category of a Internal Piano Contest

PROJECTS

RTFSS: A REAL-TIME FPGA SOUND SYNTHESIS LANGUAGE

MASTER THESIS | FEB 2020 - FEB 2021

- Auto-proposed thesis [3] targeted on creating tools for implementing efficient digital audio/signal processors on digital hardware with a higher degree of abstraction from current methods
- Involved the design of a novel programming language, called RTFSS, and corresponding compiler to VHDL hardware description language (done with C++/ANTLR4). Testing was performed on a FPGA board

AUDITORIUM ACOUSTICS TREATMENT

PROJECT | JUL 2020 - ONGOING

- On an effort to improve the acoustics of some auditoriums of the University of Aveiro, I was asked (and later hired as a service provider) to provide help and insight
- As result, so far I've successfully measured, modeled and provided solutions for an excess of 10 spaces (including auditoriums, classrooms and collaborative spaces)

AQUATIC MONITORING

COURSEWORK | FEB 2018 - JUN 2018

- Aquatic Monitoring was a group project (team of 6) for water quality monitoring in aquacultures. We constructed a complete solution from floating sensor units to parameterizable alarms and monitoring in a dashboard.
- My major roles in this project was the creation and implementation of low-level dynamic communication protocols for LoRa, architecture design and team leadership
- Our project tied for the highest grade, being later presented at Students@DETI'18 and in Techdays'18 Aveiro

FPGA .MOD PLAYER

COURSEWORK | APR 2016 - JUN 2016

- In this project we created a hardware emulator for the sound synthesis part of a Paula Chip from Amiga computers
- The system ran on a FPGA and was capable of loading a .MOD Module song, synthesize and play it, and show channels on a VGA screen
- It was a team of 2 where I worked on audio processing and my partner was tasked with the video processing
- This project was presented at Students@DETI'16 and at Techdays'16 Aveiro

VOLUNTEERING

UNIVERSITY OF AVEIRO MENTORSHIP PROGRAM

UNIVERSITY OF AVEIRO | SEP 2018 - FEB 2021

- During my MSc., I've tutored a total of 8 freshman students with their integration and first year at the academia

DAFX18: INTERNATIONAL CONFERENCE ON DIGITAL AUDIO EFFECTS 2018

UNIV. AVEIRO | SEP 2018

- DAFx18, a highly regarded conference in digital audio, was set to happen in the University of Aveiro
- I had the chance to attend the conference as a volunteer. My job was to help organize the conference and I was responsible for running talks and the auditorium
- I got to attend most talks and learn about the new tendencies of Digital Audio Processing. I also got the chance to meet some high-players in this industry

CAMBADA: MIDDLE-SIZE LEAGUE ROBOT SOCCER TEAM

IEETA UNIV. AVEIRO | OCT 2017 - JAN 2018

- Being robotics one of many interests, I volunteered at CAMBADA, a RoboCup MSL autonomous robot soccer team.
- I acquired a broad understanding on the robots' architecture, computer vision, movement, distributed environment and their high-level strategies
- Performed some work on the strategy logic and tech demos of CAMBADA, and attended ROBÓTICA 2017

PUBLICATIONS

- [1] T. Almeida, A. S. Pinho, R. Pereira, and S. Matos. Deep learning solutions based on fixed contextualized embeddings from pubmedbert on bioasq 10b and traditional ir in synergy. pages 204–221, 2022. [Access Link](#).
- [2] J. Matos, P. Martins, D. Dias, M. Neves, and A. S. Pinho. A participação de discentes na elaboração de novos materiais pedagógicos em plataformas digitais. In CNaPPES 2018 Proceedings, pages 309–313, 2018.
- [3] A. S. Pinho. rtfss: A hardware description language for digital audio processing. Master's thesis, Univesity of Aveiro, Aveiro, PT, February 2021. [Access Link](#).