Francisco Bernardo PhD • AFHEA • MA • MSc • ENG

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ABOUT

Passionate research scientist with 7 years of industry experience and 9 years of experience in R&D projects in creative audiovisual technology and multimodal interaction, at the interface between academia and industry.

EDUCATION

2020   PhD Computer Science – Goldsmiths, University of London
2013   MA Management in Creative Industries – Universidade Católica Portuguesa
2009   MSc Mobile Systems – University of Minho
2006   *Licenciatura (300 ECTS)* – Computer Science and Systems Engineering – University of Minho

EXPERIENCE

ACADEMIC POSITIONS HELD

September 2021 – current   **University College London, UK** – **Multi-Sensory Devices Lab**
                             Postdoctoral Fellow in Computer Science ([H2020 ERC-ADG 787413](#))

- Conducted simulation, optimisation, and fabrication of acoustic metamaterials (**COMSOL, Java, Python**)
- Developed an open-source python framework for automating geometric modelling, finite elements method and wave scattering simulation for acoustic metamaterials (**Python, Fortran90**, **SALOME**, **ElmerFEM, Paraview**).
- Generated synthetic datasets and applied deep learning for generative design of metamaterials (**sci-kit, pytorch**)
- Supervised a PhD student in Computer Science, and two MSc students in Data Science and Machine Learning.
- Prototyped haptic sensations using custom ultrasonic phased array transducers and acoustic metamaterials.
- Designed and evaluated empirical taste studies for virtual environments with Sony R&D, Europe.
- Teaching assistant to COMP0005 Algorithms module in the Computer Science undergraduate degree.

January 2021 – August 2021   **University of Sussex, UK** – **Experimental Music Technology Lab**
                               Postdoctoral Fellow in project *Innovating Sema* ([AH/R005154/1](#))

- Authored the [sema-engine](#) middleware for audio signal processing and domain-specific language design.
- Led full-stack engineering, devOps, systems administration, design system and documentation for https://sema.codes, a Web-based live coding playground for audio and end-to-end machine learning workflows (**Tensorflow.js, Web Audio API, C++, Emscripten, WebAssembly, Javascript, CSS, HTML, Svelte, Rollup, NodeJS**).
- Conducted user-based research to refine workflows, documentation, and video tutorials.
- Led community-building actions (4 workshops, 2 performances), coordinated design work and mentored interns.

September 2020 – Jan 2021   **City, University of London, HCI Design Centre**

- Lecturer and module leader for the INM401 Information Architecture of the MSc degree in HCI Design.

January 2019 – July 2020   **University of Sussex, UK** – **Experimental Music Technology Lab**
                             Postdoctoral Fellow in project *MIMIC* ([AH/R002657/1](#))

- Co-authored a new method for client-side browser compilation of domain-specific languages (DSL) for music and audio signal processing (won a Best Paper Award, published in the Audio Engineering Society journal).
- Led frontend software architecture and engineering with modern Web technologies (**Javascript, CSS, HTML, Svelte, Webpack, Web Audio API, WebAssembly, NodeJS, Emscripten, Tensorflow.js, Apache, AWS**).
- Core contributor to the MIMIC platform (https://mimicproject.com) and the Maximilian DSP library.
- Conducted mixed methods research (ethnography, usability evaluation, 5 workshops, 3 large scale surveys) to design and improve workflows, user experience, instructional content, and video tutorials.
- Organised community-building actions (3 performances, 4 public speaking events and 2 summer schools).
- Lectured the Interactive Music Systems module to a cohort of 19 students of the Music Technology MSc degree.

May 2019 – July 2019   **University of Arts London, UK** – **Creative Computing Institute (CCI)**
                                        Summer Course Instructor

- Created and facilitated a 5-day intensive hands-on course with design sprints and constructivist pedagogy
- Assembled a physical computing and haptics toolkit with machine learning tools for multimodal experiences
- Yielded a satisfaction index of 8.5 out of 10 from a 25 Masters students' cohort.

Feb 2015 – Dec 2018   **Goldsmiths, University of London, UK** – **Computing Department**
                                        Doctoral Researcher in project [RAPID-MIX](#) (EU H2020 ID 644862)

- Designed and developed a user-friendly machine learning development toolkit for multimodal experiences (https://rapidmixapi.com) (**C++, Emscripten**, **Javascript**, **HTML, CSS, React**).
- Structured a user-centred design research system for a consortium of 3 European research centres and 5 music technology start-ups, which contributed to the final official EU evaluation rating of "Excellent".
- Led research interventions with project stakeholders, machine learning researchers and creative developers (2 co-design workshops, 3 hackathons, 40+ interviews, ethnography, concurrent prototyping, cognitive walkthroughs, usability evaluation, mixed methods analysis) which informed the development of 6 new products.
- Conducted systematic data collection, analysis and reporting for 12 official deliverables to the EU H2020.
- Produced 3 data visualisation prototypes and a middleware for Google Soli Alpha Developers program.

May 2013 – Dec 2014   **Portuguese Catholic University, Portugal** – **Sound & Image Department**
                                        Research Assistant in project *VisualYzARt* (ERDF–COMPETE, ID 23201)

- Developed experimental prototypes for augmented reality and 3D natural user interfaces with motion capture (**Unity3D**, **C#, Vicon**, **Kinect**, **LeapMotion**), published papers, documentation and reports.
- Lectured the Interactive Sound Design module of the Digital Design Post-Graduation degree.
- Facilitated workshops on Research Strategy and Methodology Design to Master degree cohorts.

INDUSTRY POSITIONS HELD

Jan 2011 – April 2013   **Primavera Business Software Solutions, Portugal**
                                        Frontend Software Engineer for Business Intelligence products

- Co-developed the software architecture and components for business analytics dashboards with OLAP and data warehousing connectors (**Silverlight**, **C#.NET**, **SQL Server**, **Analysis Services**, **WCF**).
- Developed the UI architecture, UX and content for Business Intelligence dashboards and an iOS app.

May 2007 – May 2013   **Ubisign, Corporate TV and Digital Signage, Portugal**
                                        Senior software engineer and project manager

- Accelerated the evolution of product from desktop software to cloud-based software-as-a-service, contributing to the company's acquisition by a larger market player.
- Instituted best practices for software architecture and engineering of complex Web user interfaces.
- Developed single-page and progressive Web applications for network, channel, and content management of digital signage and corporate TV networks (**Silverlight**, **XAML**, **Prism, C#.NET**, **WCF**).
- Created a gestural-based interactive product catalogue for multimedia kiosks with audience analytics for automatic content segmentation (**Kinect**, **WPF**, **C#.NET**, **Intel AIM**, **DirectShow**, **OpenCV**).

AWARDS AND HONOURS (selected)

2021   European Commission Seal of Excellence on H2020 Marie Skłodowska-Curie grant proposal.
2019   Best Paper award at Web Audio Conference, Trondheim, Norway.
2016   Prototypes for Google ATAP Soli Alpha Developer featured at the Google I/O 2016.
2013   Best Paper award at Vienna Music Business Research Days, Vienna, Austria.

ADDITIONAL INFO

Languages: Portuguese (native), English (proficient), Spanish (intermediate), French (basic).
Canadian-Portuguese (dual) citizenship, UK settled status. Multi-instrumentalist (piano 6 years, guitar 20+ years, etc)