

FRANCISCO BERNARDO • PhD • AFHEA • MA • MSc • ENG

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EDUCATION

- 02.2015 – 01.2020 Ph.D Goldsmiths, University of London – Computer Science
Interactive Machine Learning for End-User Innovation: An Action Design Research approach – (advisors: Rebecca Fiebrink, Mick Grierson)
- 09.2011 – 09.2013 M.A. Universidade Católica Portuguesa – Management in Creative Industries
The Impact of Disintermediation in Independent Music Business Models (Summa Cum Laude) (advisors: Luís Gustavo Martins, Ricardo Morais)
- 09.2006 – 09.2009 M.Sc. University of Minho – Mobile Systems
Bluetooth Naming for Situated Interaction in Ubiquitous Environments (advisor: Rui José)
- 09.2000 – 09.2006 *Licenciatura*, University of Minho – Computer Science and Systems Engineering (5-year, 300 ECTS)

RESEARCH EXPERIENCE

01.2019 – 07.2020 **University of Sussex, UK**

Postdoctoral Researcher in project MIMIC ([AH/R002657/1](https://mimicproject.com))

- Core collaborator in the UKRI/AHRC -funded MIMIC project (University of Arts London, Goldsmiths College, Durham University, Sussex University, Google Magenta).
- 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).
- Conducted mixed methods research (ethnography, usability evaluation, 5 workshops, 3 large scale surveys) to inform and improve the design of instructional content, video tutorials and user experience.
- Co-created a new live coding system for machine learning and user community (<https://sema.codes>).
- Led frontend software architecture and engineering with high-performance Web technologies (Javascript, Typescript, CSS, HTML, Svelte, Webpack, Web Audio API, C++, Emscripten, WebAssembly, Tensorflow.js).
- Organised and deployed community-building interventions (3 performances, 4 public speaking events and 2 summer schools).
- Core contributor to the MIMIC platform (<https://mimicproject.com>) and the Maximilian DSP library.
- Lectured the Interactive Music Systems module to a Music Technology degree cohort of 19 students.

02.2015 – 12.2018 **Goldsmiths, University of London, UK**

Doctoral Researcher in RAPID-MIX (EU H2020 ICT ID 644862)

- Structured a user-centred design research system for the RAPID-MIX consortium—3 European research centres and 5 music technology start-ups—MTG/Universitat Pompeu Fabra (ES), IRCAM (FR), Goldsmiths College (UK), ROLI (UK), Reactable Systems (ES), PLUX (PT), ORBE (FR), AudioGaming (FR).
- Led research interventions with machine learning researchers and creative developers (2 co-design workshops, 3 hackathons, 40+ interviews, ethnography, concurrent prototyping, cognitive walkthroughs, usability evaluation, mixed methods data analysis) which informed the development of 6 new products.
- Co-designed a user-friendly machine learning development toolkit (<https://rapidmixapi.com>) which accelerated the adoption by creative software developers (C++, Emscripten, Javascript, HTML).

- Conducted systematic data collection, analysis and reporting for 12 official deliverables to the EU H2020 project officers, on findings, processes, design principles and recommendations for best practices, which contributed to the final official EU evaluation rating of “Excellent”.
- Produced 3 data visualisation prototypes and middleware for the Google Soli Alpha Developers program.

05.2013 – 12.2014 **Universidade Católica Portuguesa (UCP), Portugal**
Research Assistant in project VisualYzARt (FEDER–COMPETE, ID 23201)

- Digital Arts research lead in the VisualYzARt consortium—YDreams, Universidade de Coimbra, UCP, Instituto Politécnico de Leiria, Instituto Politécnico de Santarém.
- Produced the state-of-the-art and market research and developed experimental prototypes for augmented reality and 3D natural user interfaces (Unity, C#, Vicon, Kinect, LeapMotion, PureData).
- Lectured the Interactive Sound Design module of the Digital Design Post-Graduation.
- Facilitated workshops on Research Strategy and Methodology Design to two Master’s degree cohorts.

05.2006 – 05.2007 **University of Minho, Portugal**
Research Assistant at ALGORITMI Research Centre (UbiComp group)
in project SituAction (POS-C/EIA/58832/2004)

- Designed and developed middleware for sensor fusion, computer vision and video processing for situated interaction with public screen and context-aware applications.
- Conducted Human factors study, engaged a commercial partner, and published a paper.
- Contributed to the successful transfer of research products into a start-up product.

TEACHING EXPERIENCE

<i>09.2020 – current</i>	Information Architecture – 2nd-year module of the MSc Human-Computer Interaction Design, Centre for HCI Design, City, University of London, UK
<i>09.2019 – 01.2020</i>	Interactive Music Systems – 2nd-year module of the Music Technology undergraduate degree, School of Media, Film and Music, University of Sussex, Brighton, UK
<i>01.07.2019</i>	Designing with Data and Interactive Machine Learning – Summer course Instructor (5-day intensive course) at the Creative Computing Institute, University of the Arts, London, UK
<i>12.02.2018</i>	Designing with Data and Interactive Machine Learning – (invited lecture) Masters in Product Design, Royal College of Art, London, UK
<i>11.2014 – 12.2014</i>	Interactive Sound Design and Dataflow Programming with PureData – module of the Post-graduation in Digital Design, UCP, Porto, Portugal
<i>14.03.2014</i>	Research Strategy and Methodology Design – (invited lecture) Masters in Music Teaching, UCP, Porto, Portugal
<i>01.03.2014</i>	Research Strategy and Methodology Design – (invited lecture) Masters in Management in the Creative Industries, UCP, Porto, Portugal

INDUSTRY EXPERIENCE

01.2011 – 03.2013 **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, user experience and content for Business Intelligence dashboards.
- Designed, developed and managed a mobile iOS app for ERP global sales indicators (Objective-C).

05.2007 – 03.2013

Ubisign, Corporate TV and Digital Signage, Portugal
Senior software engineer and project manager

- Accelerated the product evolution from desktop software to a 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, C#.NET, WCF).
- Developed a high-performance desktop multimedia system and plugins (C#.NET, WPF and DirectShow).
- 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).

PEER-REVIEWED PUBLICATIONS

My publications are reported with their number of citations as available from my [Scholar profile](#). (total citations: 84, h-index: 5, i10-index: 3):

- Bernardo, F., Kiefer, C., Magnusson, T. (2020). *A Signal Engine for a Live Code Language Ecosystem*. Journal of Audio Engineering Society. Volume 68 Issue 10 pp. 756-766; October 2020
- Bernardo, F., Zbyszyński, M., Grierson, M., Fiebrink, R. (2020) *Designing and Evaluating the Usability of a Machine Learning API for Rapid Prototyping Music Technology*. Frontiers in Artificial Intelligence – Machine Learning and Artificial Intelligence. Special issue on Music and AI. Vol. 3. DOI:10.3389/frai.2020.00013.
- Bernardo, F. (2020). *Interactive Machine Learning for User-Innovation Toolkits: An Action Design Research approach*. Doctoral thesis. Goldsmiths, University of London.
- Bernardo, F., Kiefer, C., Magnusson, T. (2020). *Designing for a Pluralist and User-Friendly Live Code Language Ecosystem with Sema*. 5th International Conference on Live Coding, University of Limerick, Limerick, Ireland.
- Bernardo, F., Kiefer, C., Magnusson, T. (2019). *An AudioWorklet-based Signal Engine for a Live Coding Language Ecosystem*. In Proceedings of Web Audio Conference 2019, Norwegian University of Science and Technology (NTNU), Trondheim, Norway (*Best Paper Award*).
- Bernardo, F., Grierson, M., Fiebrink, R. (2018). *User-Centred Design Actions for Lightweight Evaluation of an Interactive Machine Learning Toolkit*. Journal of Science and Technology of the Arts (CITARj), v. 10, n. 2, p. 2- 25-38, jul. 2018. ISSN 2183-0088. DOI: <http://dx.doi.org/10.7559/citarj.v10i2.509>.
- Bernardo, F., Zbyszyński, M., Fiebrink, R., Grierson, M. (2017). *Interactive Machine Learning for End-User Innovation*. Designing the User Experience of Machine Learning Systems. In Proceedings of Association for the Advancement of Artificial Intelligence (AAAI) Spring Symposium, Stanford University, Palo Alto, CA.
- Bernardo, F., Arner, N., Batchelor, P. (2017). *O Soli Mio: Exploring Millimeter Wave Radar for Musical Interaction*. Proceedings of New Interfaces for Musical Expression 2017, Aalborg University, Copenhagen, Denmark.
- Parkinson, A., Zbyszyński, M., Bernardo, F. (2017). *Demonstrating Interactive Machine Learning Tools for Rapid Prototyping of Gestural Instruments in the Browser*. Proceedings of Web Audio Conference 2017, Queen Mary University of London, London, UK.
- Ward, N., Ortiz, M., Bernardo, F., Tanaka, A. (2016) *Designing and Measuring Gesture using Laban*

Movement Analysis and Electromyogram. Proc. of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing.

- Bernardo, F., Pestana, P., Martins, L. (2015). *The Smart Stage: Designing 3D Interaction Metaphors for Immersive and Ubiquitous Music Systems*. International Conference on New Music Concepts (ICNMC 2015), Treviso, Italy - ISBN: 978-88-6551-188-6.
- Bernardo, F., Martins, L. (2014). *Disintermediation Effects on Independent Approaches to Music Business*. International Journal of Music Business Research (IJMBR) – issn 2227-5789.
- José, R., Bernardo, F. (2009). *Extended Bluetooth naming for empowered presence and situated interaction with public displays*. 3th Symposium of Ubiquitous Computing and Ambient Intelligence
- Bernardo, F. (2014). *Music video games in live performance: Catachresis or an emergent approach?* Videojogos 2014 - Conferência de Ciências e Artes dos Videojogos, Barcelos, Portugal.

PEER REVIEWING

2019	International Conference on Live Interfaces (ICLI).
2019	ACM Human Factors in Computing Systems (CHI).
2018	ACM Human Factors in Computing Systems (CHI).
2016	International Conference on Tangible Embedded and Embodied Interaction (TEI).

WORKSHOP LEADERSHIP AND FACILITATION

07.2020	Sema: Live Coding for Machine Learning (2-week workshop), University of Sussex, UK
2020	Live Coding Machine Learning with Sema – workshop organiser and facilitator at the International Conference for Live Coding, University of Limerick, Ireland
2019	Designing and Performing with Live Coding Languages for Signal Processing and Machine Intelligence on the Web – workshop organiser and facilitator at Web Audio Conference 2019, Norwegian University of Science and Technology (NTNU), Trondheim, Norway
2019	MIMIC Artist Summer Workshop – 2-week workshop organiser and facilitator, Sussex Humanities Lab – University of Sussex, Brighton, UK
2019	Live Coding Machine Learning – workshop at the 4th International Conference on Live Coding, MediaLab Prado, Madrid, Spain
2017	The RAPID-MIX API toolkit (2-week long summer workshop) leader. eNTERFACE'17 – 13th International Summer Workshop on Multimodal Interfaces, Porto, Portugal
2017	Sound Design in the Cloud – Workshop facilitator. AudioMostly 2017: Augmented and Participatory Sound and Music Experiences, Queen Mary University of London, UK
2016	SoliDSPFeatures2OSC: Feature Selection Tool for Prototyping Creative Audiovisuals with Soli – Presenter - Soli Alpha Developers Workshop, Google, Mountain View, US
2016	Interactive Applications in Machine Learning – Workshop co-presenter with Atau Tanaka, International Conference on Musical Gesture as a Creative Interface, Portugal
2015	Design de Tecnologias Wearable para Performance Expressiva e Musical – (workshop) facilitator with Michael Zbyszynski. MakerFaire Lisbon 2015, Lisbon, Portugal

INVITED TALKS

15.02.2020	“AI in the Creative Industries”, AAAS, UKRI Live Arena, Seattle, US
25.02.2020	“Making Music and Art with Machine Intelligence”, AI+JS, Meetup London, UK
19.04.2018	“Fostering synergies between Art and Innovation”, ACT Utopia, ETSIDI-UPM, Madrid
03.07.2017	“The EU H2020 project RAPID-MIX” eNTERFACE'17 – 13th International Summer Workshop on Multimodal Interfaces, UCP, Porto, Portugal

- 22.11.2014 “The Smart Stage: Designing interaction for immersive and ubiquitous music systems” – Encontro Nacional de Investigação em Música (ENIM), Lisbon, Portugal
- 21.06.2013 “Disintermediation effects in the music business” – Vienna Music Business Research Days, University of Music and Performing Arts, Vienna, Austria

ORGANISATION

- 07.2020 Sema: Live Coding with Machine Learning, 2-week workshop, Sussex University, UK
- 07.2019 MIMIC Artist Summer Workshop, Sussex University, UK
- 07.2017 The RAPID-MIX API toolkit – eNTERFACE'17, 13th International Summer Workshop on Multimodal Interfaces, UCP, Porto, Portugal
- 09.2014 Doctoral Summer School for Developing Media, Culture and Social Innovation for Creative Cities” in partnership with Hanover University, UCP, Porto, Portugal
- 07.2006 CMUS – Conference on Mobile and Ubiquitous Systems, University of Minho, Portugal

AWARDS AND HONOURS

- 2019 Best Paper award at Web Audio Conference, Trondheim, Norway
- 2017 Spotify Award at the Anvil Hack III at Goldsmiths’ Hacksmiths Tech society, London, UK
- 2016 Best-in-Show award at the Sex Tech Hackathon, Goldsmiths, London, UK
- 2016 Google ATAP Soli Alpha Developer prototypes selected (10/80) and featured at the Google I/O
- 2015 PhD scholarship funded by the EU H2020 project RAPID-MIX
- 2013 Best Paper award at Vienna Music Business Research Days, Vienna, Austria
- 2013 Research grant awarded by *Fundação da Ciência e Tecnologia* (FCT), Portugal
- 2009 The People’s Music Award in the Off-the-Beaten Music Category, London with Papercutz band
- 2007 Research grant awarded by *Fundação da Ciência e Tecnologia* (FCT), Portugal
- 2006 Research grant awarded by *Fundação da Ciência e Tecnologia* (FCT), Portugal

PERFORMANCES (selected)

- 2020 “Three Ravens” – live coding with T. Magnusson and C. Kiefer at 5th ICLC, Limerick, Ireland
- 2019 “Three Pidgins” – live coding with T. Magnusson and C. Kiefer at WAC 2019, NTNU, Norway
- 2019 Live coding as MNISTREL at Algo/Mesh, ALGOMECH Festival, Sheffield, UK
- 2019 Live coding as MNISTREL at MIMIC Artist, Rose Hill, Brighton, UK
- 2009 Concert tour with Papercutz band, to promote debut album “Lylac”, Portugal

CERTIFICATIONS (selected)

- 2020 Associate Fellow of the Higher Education Academy, Level 7 on FHEQ UK, 15 credits
- 2019 GDPR – University of Sussex
- 2017 Science Communication – SciConnect
- 2014 Critical Thinking: Processes and tools – UCP
- 2012 Certificate of Proficiency in English – Cambridge ESOL
- 2011 Microsoft Certified Professional in .NET Application Development Foundation
- 2005 Leadership Course – Portuguese Military Academy

ADDITIONAL INFO

Languages: Portuguese (native), English (proficient), Spanish (intermediate), French (basic).

Canadian Portuguese (dual) citizenship, UK settled status.

Multi-instrumentalist experienced in piano (6 years), guitar (20+ years), electronics and audiovisuals.