Patrícia **Bota**

Lisbon – Portugal

patricia.bota@tecnico.ulisboa.pt | patriciabota

Biomedical Engineer • PhD

SCIENTIFIC IMPACT

Citations: 730

h-index: 7

i10-index: 7

3RvlpVcAAAAJ

Google Scholar ID
`https://scholar.google.com/citations?user=3RvlpVcAAAAJ`

0000-0002-0514-7517

ORCID
`https://orcid.org/0000-0002-0514-7517`

Patrícia Bota

ResearchGate
`https://www.researchgate.net/profile/Patricia-Bota`

SCHOLASTIC TRAINING

Biomedical Engineering
PhD *2019 – 2024*
Instituto Superior Técnico da Universidade de Lisboa

Biomedical Engineering
MSc *2013 – 2018*
NOVA School of Science and Technology

PROFESSIONAL EXPERIENCE

Symphathia Technologies *2024*
AI Strategy Advisor
Duties: Supervisor in the development of a wearable smart sock that reads electrodermal activity for mental health assessment.

IT - Instituto de Telecomunicações, Pattern and Image Analysis - Lisbon (PIA-Lx) *2019 – 2020*
Research Assistant
Duties: Projects supervision, research in the area of biomedical engineering, machine learning, and signal processing, grant writer.

Fraunhofer Portugal *2018 – 2019*

Research Assistant
Duties: Implemented a feature extraction library for time series data (TSFEL) [1], implemented and evaluated a semi-supervised learning algorithm for Human Activity Recognition algorithms based on smartphone inertial sensors, reducing the annotated data by +89% while maintaining an accurate performance.

ACADEMIC EXCHANGES

Centrum Wiskunde & Informatica *2022*
Visiting Researcher
Duties: Developed novel interpersonal weighted group synchrony approach for emotion recognition, surpassing previous work for K-EmoCon dataset on arousal, and providing a new baseline on AMIGOS long videos.

Fachhochschule Technikum Wien *2016 – 2017*
ERASMUS Student

SCHOLARSHIPS

FCT – Fundação para a Ciência e Tecnologia *2021*
Ref.: 2020.06675.BD

Xinhuanet Future Media Convergence Institute (FMCI) *2019 – 2020*
Ref.: BIM Nª01 XiPhy

Associação Fraunhofer Portugal Research *2018 – 2019*
Ref.: BIC/FhP-17/008

SOCIETIES AND ASSOCIATIONS

IEEE – Institute of Electrical and Electronic Engineers *2021 –*
Ref.: Student Member Nº 96020556

LANGUAGES

Portuguese (native), English (fluent), German (beginner)

INTERESTS

Machine Learning, Deep Learning, Signal Processing, Biomedical Engineering, Affective Computing

Contents

A) RESEARCH

My research experience started in 2018 at Fraunhofer Lisboa, where I had a first glance at academic research and the challenges within. Since then, I have taken part in 3 research laboratories, with over 10 papers in peer-reviewed journals (700+ citations, around 80% Q1), and 4 Int'l Conferences.

A.I) SCIENTIFIC PUBLICATIONS

When available, journal publications include the quartile according to the SCImago Journal Ranking (SJR) and the impact factor. Conference publications include the conference rank according to CORE. Involved collaborations are denoted by their institutional affiliation.

Refereed International Journals

1. L. Aly, L. Godinho, **P. Bota**, G. Bernardes, and H. P. da Silva, "Acting emotions: A comprehensive dataset of elicited emotions," *Scientific Data*, vol. in press, 2024.
   SJR: Q1; IF: 9.8
   In collaboration with INESC-TEC, University of Porto

2. **P. Bota**, C. Wang, A. L. N. Fred, and H. Plácido Da Silva, "A review, current challenges, and future possibilities on emotion recognition using machine learning and physiological signals," *IEEE Access*, vol. 7, no. 1, pp. 140990–141020, 2019.
   SJR: Q1; IF: 3.9
   In collaboration with XinhuaNet FMCI

3. **P. Bota**, C. Wang, A. Fred, and H. Silva, "Emotion assessment using feature fusion and decision fusion classification based on physiological data: Are we there yet?," *Sensors*, vol. 20, no. 17, p. 4723, 2020.
   SJR: Q2; IF: 3.847
   In collaboration with XinhuaNet FMCI

4. **P. Bota**, A. Fred, J. Valente, C. Wang, and H. P. da Silva, "A dissimilarity-based approach to automatic classification of biosignal modalities," *Applied Soft Computing*, vol. 115, p. 108203, 2022.
   SJR: Q1; IF: 8.263
   In collaboration with BrainAnswer

5. **P. Bota**, E. Flety, H. P. d. Silva, and A. Fred, "EmotiphAI: a biocybernetic engine for real-time biosignals acquisition in a collective setting," *Neural Computing and Applications*, vol. 35, no. 8, pp. 5721–5736, 2023.
   SJR: Q1; IF: 5.606
   In collaboration with IRCAM

6. R. Silva, G. Salvador, **P. Bota**, A. Fred, and H. Plácido da Silva, "Impact of sampling rate and interpolation on photoplethysmography and electrodermal activity signals' waveform morphology and feature extraction," *Neural Computing and Applications*, vol. 35, no. 8,

pp. 5661–5677, 2023.
SJR: Q1; IF: 5.606

7. M. N. Supelnic, A. F. Ferreira, **P. Bota**, L. Brás-Rosário, and H. Plácido da Silva, "Benchmarking of sensor configurations and measurement sites for out-of-the-lab photoplethysmography," *Sensors*, vol. 24, no. 1, 2024.
SJR: Q1; IF: 3.847

8. **P. Bota**, P. Cesar, A. Fred, and H. Silva, "Exploring retrospective annotation in long-videos for emotion recognition," *IEEE Trans. on Affective Computing*, vol. in press, 2023.
SJR: Q1; IF: 13.99
In collaboration with CWI

9. **P. Bota**, J. Brito, A. Fred, P. Cesar, and H. Silva, "A real-world dataset of group emotion experiences based on physiological data," *Scientific Data*, vol. 11, no. 1, pp. 1–17, 2024.
SJR: Q1; IF: 9.8
In collaboration with CWI and Diferencial

10. **P. Bota**, T. Zhang, A. El Ali, A. Fred, H. P. da Silva, and P. Cesar, "Group synchrony for emotion recognition using physiological signals," *IEEE Trans. on Affective Computing*, vol. 14, no. 4, pp. 2614–2625, 2023.
SJR: Q1; IF: 13.99
In collaboration with CWI

11. **P. Bota**, R. Silva, C. Carreira, A. Fred, and H. P. da Silva, "BioSPPy: A python toolbox for physiological signal processing," *SoftwareX*, vol. under revision, 2023.
SJR: Q2; IF: 3.4

12. M. Barandas, D. Folgado, L. Fernandes, S. Santos, M. Abreu, **P. Bota**, H. Liu, T. Schultz, and H. Gamboa, "TSFEL: Time series feature extraction library," *SoftwareX*, vol. 11, p. 100456, 2020. SJR: Q2; IF: 3.4

13. **P. Bota**, J. Silva, D. Folgado, and H. Gamboa, "A semi-automatic annotation approach for human activity recognition," *Sensors*, vol. 19, no. 3, p. 501, 2019. SJR: Q1; IF: 3.847

Refereed International Conference

1. L. Aly, **P. Bota**, L. Godinho, G. Bernardes, and H. Silva, "Acting emotions: physiological correlates of emotional valence and arousal dynamics in theatre," in *ACM Int'l Conf. on Interactive Media Experiences*, pp. 381–386, 2022.
In collaboration with INESC-TEC, University of Porto

2. G. F. D. Salvador, **P. Bota**, V. Vinayagamoorthy, H. Plácido da Silva, and A. Fred, *Smartphone-Based Content Annotation for Ground Truth Collection in Affective Computing*, p. 199–204. Association for Computing Machinery, 2021.
   In collaboration with BBC News

3. **P. Bota**, C. Wang, A. L. Fred, and H. Silva, "A wearable system for electrodermal activity data acquisition in collective experience assessment.," in *ICEIS (2)*, pp. 606–613, 2020. CORE: C
   In collaboration with XinhuaNet FMCI

4. **P. Bota**, A. Fred, J. Valente, and H. Silva, "Automatic classification of physiological signals modalities," in *Int'l Meeting of the Portuguese Society of Physiology*, 2019

A.II) DATASETS

I have been involved in the creation of 2 datasets related to emotion using physiological data. Both datasets are publicly available online.

1. L. Aly, L. Godinho, **P. Bota**, G. Bernardes, and H. P. da Silva, "Acting emotions: A comprehensive dataset of elicited emotions," *Scientific Data*. figshare https://figshare.com/articles/dataset/DECEiVeR/23579862 (2024)

2. **P. Bota**, J. Brito, A. Fred, P. Cesar, and H. P. Silva, "A real-world dataset of group emotion experiences based on physiological data," jul 2024. Zenodo https://zenodo.org/record/8136135 (2023)

A.III) COLLABORATIONS

I have taken part in over 15 collaborative projects, both internationally (6) and nationally, demonstrating my dedication to expanding my professional and academic network. This diverse experience has honed my adaptability to different cultural and scientific environments, enriching my expertise and fostering global perspectives in my work.

ISCTE & Univ. Autónoma *2023 – 2024*
Desc.: Physiological data collection on primary school students for assessment of mental health. Analysis of the impact of meditation on the students' mental health.
Partn.: Iolanda Galinha (Universidade Autónoma), and Patricia Arriaga (ISCTE), Hugo Silva (IST-UL)

INESC-ID/IST-UL *2023 – 2024*
Desc.: Design of a platform for emotion representation.
Partn.: Sofia Morgado (IST-UL), Sandra Gama (INESC-ID/IST-UL), Hugo Silva (IST-UL)

FCUL *2023 – 2024*
Desc.: Exploration of physiological signals for mental health assessment.
Partn.: Catarina Lima (FCUL), Hugo Silva (IST-UL)

INESC-TEC *2022 – 2024*
Desc.: Creation of a dataset of elicited emotions in a theatre performance. Analysis of physiological correlates of emotional valence and arousal dynamics in theatre.
Partn.: Luis Aly (INESC-TEC/UPorto), Gilberto Bernardes (INESC-TEC/UPorto), Hugo Silva (IST-UL/IT), Ana Fred (IST-UL/IT)

Hospital da Luz *2023*
Desc.: Analysis of learning through physiological signals.
Partn.: Sofia Silvestre (IST-UL), Cátia Costa (HLuz), José Maria Moreira (HLuz), Afonso Ferreira (INSEC), Hugo Silva (IST-UL)

IADE *2023*
Desc.: Design process of an epilepsy monitoring wearable device.
Partn.: Mafalda Morgado (IADE) and Hugo Silva (IST-UL/IT)

Unbabel *2023*
Desc.: Infrastructure for data collection using Electromyography (EMG) and Electrooculography (EOG) physiological signals towards a platform that facilitates communication in patients with Amyotrophic Lateral Sclerosis (ALS).
Partn.: Catarina Farinha (Unbabel), Leonor Pereira (IT), Hugo Silva (IST-UL, IT), Tiago Boleanos (IST-UL, IT), Mariana Nunes (IT)

CWI *2022*
Desc.: Design of an algorithm to explore group emotion recognition using physiological signals.
Partn.: Abdallah El Ali (CWI), Pablo Cesar (CWI), Hugo Silva (IST-UL)

Tallin & Tartu University *2019 – 2022*
Desc.: Development of an infrastructure for group physiological data collection in real-time and interaction with media devices.
Partn.: Taavet Jansen (UTallinn), Aleksander Väljamäe, Joana Brito (IT), Hugo Silva (IST-UL/IT), Ana Fred (IST-UL/IT)

BBC News *2021*
Desc.: Study of the impact of news on the audience's emotional state. Elaboration and validation of a platform for real-time emotion annotation and exploration of unsupervised learning algorithms to detect relevant emotional moments in films.
Partn.: Hugo Silva (IST-UL/IT), Vinoba Vinayagamoorthy (BBC), Ana Fred (IST-UL/IT)

Ircam *2021*
Desc.: Development and validation of infrastructure for group data collection using the BITalino R-IoT device. The platform was able to collect data from 10 devices at 60 Hz and 20 at 25 Hz, surpassing the current devices for physiological group data collection.
Partn.: Hugo Silva (IST-UL/IT), Emmanuel Flety (Ircam), Ana Fred (IST-UL/IT)

ESMAE *2020*
Desc.: Physiological data collection of an audience in an opera live performance.
Partn.: Ana Rosado (ESMAE), António Salgado (ESMAE), and Hugo Silva (IST-UL/IT)

XinhuaNet FMCI *2019*
Desc.: Exploration of the field of group physiological emotion recognition. Validation of a device for group data collection relying on the electrodermal activity sensor, a survey of the literature on affective computing.
Partn.: Hugo Silva (IST-UL/IT), Chen Wang (Xinhuanet FMCI), Ana Fred (IST-UL/IT)

BrainAnswer *2019*
Desc.: Development of physiological signal recognition algorithm. The method explored the use of a dissimilarity-based against feature-based space, with an accuracy of $> 92\%$ and $> 96\%$, for the online and offline settings respectively.
Partn.: Hugo Silva (IST-UL/IT), João Valente (BrainAnswer)

A.IV) PROTOTYPES

EmotiphAI Wearable and Hub *2019 – 2024*
Desc.: Wearable and required infrastructure for group data collection using physiological signals. EmotiphAI consists of a wearable device with physiological sensors (electrodermal activity and photoplethysmography); a hub (single-board computer) to run software and store locally the collected data; and an end-user platform to visualize the data in real time. Three platforms were evaluated based on different devices, V1: FMCI wearable; V2: BITalino R-IoT; V3: ScientISST CORE.

B) TEACHING

My teaching activity started during the development of my Ph.D. program, where I had the chance to serve as a teaching assistant in diverse curricular units. As a teaching Assistant, I took many roles, from a lecturer in theoretical and practical classes, supervisor in MSc thesis and BSc thesis preparation projects, to UC projects supervisor.

B.I) PEDAGOGICAL MATERIAL

I have been involved in both the creation and/or improvement of pedagogical materials, namely tutorials, laboratory guides and open-source libraries. These materials were created to support the curricular units and projects in which I was involved, and are available online.

ScientISST NOTES *2021*
Jupyter Notebooks repository with tutorials on data acquisition, signal processing, feature extraction, and classification, to support curricular unit for biomedical engineering at IST/UL, namely "Introduction to Biomedical Engineering" and "Machine Learning in Bioengineering". I was a co-author in some of the notebooks namely "Signal Classification Using SL", "Classification of Human Activity Data" and "Clustering of Human Activity Data".
Co-authored by: Ana Fred (IST-UL/IT), Hugo Silva (IST-UL/IT), Joana Pinto (IT), Mariana Abreu (IST-UL/IT), Vicente Garção (IST-UL/IT).
Available on: https://github.com/PIA-Group/ScientIST-notebooks

BioSPPy library *2019 – 2023*
A toolbox for physiological computing written in Python covering the main steps required for biosignals processing, from data loading, filtering, feature extraction, hypothesis testing and clustering. The BiosPPY library results from the developments of MSc and Ph.D. students at IT throughout the years, having over 400k downloads and more than 400 citations on Google Scholar. I integrated new features namely the feature extraction module, allowing the extraction of over 200 features across the state-of-the-art domains such as time, frequency, and time-frequency as well as unexplored domains such as recurrence quantitative analysis (phase-space) and cepstral analysis.
Co-authored by: Ana Fred (IST-UL/IT), Hugo Silva (IT), Carlos Carreira (IT), and Rafael Silva (IT), among others.
Available on: https://github.com/scientisst/BioSPPy

TSFEL library *2018 – 2019*
TSFEL assists researchers on exploratory feature extraction tasks on time series without requiring significant programming effort. I was involved in creating the user interface provided by Google Sheets to extract the features, as well as the algorithms to automatically extract over 60 different features on the statistical, temporal and spectral domains. It has over 380k downloads on Git Hub.
Co-authored by: Marília Barandas (Fraunhofer Portugal) and Duarte Folgado (Fraunhofer Portugal), Patricia Bota (IST-UL/IT), among others.
Available on: github.com/fraunhoferportugal/tsfel

B.II) TEACHING ACTIVITY

I have taught or had an active role in supervising and preparing the supporting materials of diverse fields from signal processing to machine learning, covering European Qualifications Framework (EQF) 5 (BSc) to EQF 6 level students (MSc). The curricular units with the omission of the corresponding curricular unit reference code denote UC in which I have assisted in the preparation of supporting materials and/or student supervision, without formally being an associated faculty member.

Instituto Superior Técnico (IST) - Universidade de Lisboa (UL)

Introduction to Biomedical Engineering *2019 – 2023*
Integrated MSc in Biomedical Engineering
Year: 1; *Semester:* 1; *Students:* 3 (2019/2020), 6 (2020/2021), 6 (2022/2023)
Coordinator: Ana Fred (IST-UL, IT), Inês Marques (IST-UL, CEG-IST), Jorge Martins (IST-UL, CSI-IDMEC), João Folgado (IST-UL, IDMEC), Monica Oliveira (IST-UL)
Faculty: Ana Fred (IST-UL, IT), Hugo Plácido da Silva (IST-UL, IT), João Dias (IST-UL), Luís Sousa (IST-UL, IDMEC), Margarida Silveira (IST-UL, ISR), Miguel Silva (IST-UL, IDMEC), Patrícia Figueiredo (IST-UL, ISR), Paulo Lobato Correia (IST-UL, IT), Paulo Fernandes (IST-UL), Rita Nunes (IST-UL, ISR), Tiago Fernandes (IST-UL) and Zita Martins (IST-UL), Monica Oliveira (IST-UL), João Folgado (IST-UL)
Duties: Student mentoring, and preparation of supporting materials.
Syllabus: Stimulate critical analysis and familiarize students with practical problems in biomaterials, artificial organs, biotechnology, bioinformatics, computational biology, biomechanics, instrumentation, and acquisition of physiological signals.

Machine Learning in Bioengineering *2021 – 2023*
Integrated MSc in Biomedical Engineering
Year: 4; *Semester:* 2; *Students:* 3 (2021/2023), 6 (2022/2023)
Coordinator: Ana Fred (IST-UL)
Faculty: Ana Fred (IST-UL)
Duties: Laboratory class preparation and student mentoring.
Syllabus: Unsupervised, semi-supervised, and supervised learning; Probability and information theory; Dissimilarity-based data representation; Bayesian classifiers and discriminant analysis; Instance-based learning; Evaluation of classifier performance; Auto-encoders as a dimensionality reduction method.

MEEC1383 Portfolio MEEC *2020-2021*
Integrated MSc in Electrical Engineering
Year: 5; *Semester:* 1; *Students:* 12 (2020/2021)
Coordinator: João Sequeira (IST-UL)
Faculty: Carlos dos Santos (IST-UL), Pedro Martin (IST-UL), António Topa (IST-UL), Pedro Batista (IST-UL), João Costeira (IST-UL), João Sequeira (IST-UL)
Duties: Taught laboratory class.
Syllabus: Introduction to Electrical and Computer Engineering by writing and designing code, written expression skills in latex and engineering processes and procedures.

B.III) STUDENT GUIDANCE AND SUPERVISION

I have co-supervised students completing training programs over 5 MSc, 5 BSc and 6 inter students, ranging from EQF Level 5 (BSc) to EQF Level 6 (MSc), from diverse backgrounds from biomedical eng. to electrical eng. and computer science, with works producing technical and scientific achievements of international relevance, including journals and international conferences.
Due to the institutional requirements for student supervision, most cases have been performed in collaboration without being a formal co-advisor, these are identified by the *.

MSc

1. S. Morgado, "AI-powered emotion well-being for everyone," MSc thesis, Instituto Superior Técnico da Universidade de Lisboa, 2024.
   Advisor: Sangra Gama (IST-UL/INESC-ID) and Hugo P. da Silva (IST-UL/IT)

2. *J. Alves, "Facial emotion recognition for mental well-being assessment in the workplace," MSc thesis, Instituto Superior Técnico da Universidade de Lisboa, 2022.
   Advisor: Hugo P. da Silva (IST-UL/IT) and Ana Fred (IST-UL/IT)

3. *G. Salvador, "Real world group emotional analytics using electrodermal activity signals," MSc thesis, Instituto Superior Técnico da Universidade de Lisboa, 11 2021.
   Advisor: Hugo P. da Silva (IST-UL/IT) and Ana Fred (IST-UL/IT)

4. *C. Lima, "Psychophysiological effects of guided imagery based intervention on the academic development of children," MSc thesis, Faculdade de Ciências da Universidade de Lisboa, 2024.
   Advisor: Hugo P. da Silva (IST-UL/IT), Nuno Matela (FCUL) and Brigida Ferreira (FCUL)

5. *M. Sampaio, 2024. MSc final project, Instituto Superior Técnico - Universidade de Lisboa
   Co-Advisor: Hugo Silva (IST-UL/IT)

BSc

1. T. Talento, "Movie emotional content analysis," 2023. BSc final project, Instituto Superior Técnico - Universidade de Lisboa
   Co-Advisor: Hugo Silva (IST-UL/IT)

2. I. Salema, "Emotion analysis using facial expression recognition," 2023. BSc final project, Instituto Superior Técnico - Universidade de Lisboa
   Co-Advisor: Hugo Silva (IST-UL/IT)

3. M. Supelnic, "Benchmarking of sensor configurations and measurement sites for out-of-the-lab photoplethysmography," 2024. BSc final project, Instituto Superior Técnico - Universidade de Lisboa
   Co-Advisor: Afonso Ferreira (INESC), Hugo Silva (IST-UL/IT)

4. F. Silva and Z. Xu, 2024. BSc final project, Instituto Superior Técnico - Universidade de Lisboa
   Co-Advisor: Hugo Silva (IST-UL/IT)

5. S. Silvestre, "Learning enhancement using affective computing," 2024. BSc final project, Instituto Superior Técnico - Universidade de Lisboa
   Co-Advisor: Hugo Silva (IST-UL/IT), Cátia Costa (HLuz), José Moreira (HLuz)

Interns

1. J. Brito, "A proof-of-concept neurosecurity study based on peripheral physiological signals," 2022 – 2023. Instituto Telecomunicações

2. A. Gonçalves, "Integration of ScientISST core in EmotiphAI," 2022. Instituto Telecomunicações

3. P. Correia, "Real-world data collection," 2021 – 2022. Instituto Telecomunicações

4. C. Bento, "Data collection using FMCI device," 2019 - 2020. Instituto Telecomunicações

5. D. Venancio, "Kubernetes for group data collection - EmotiphAI," 2023. Instituto Telecomunicações

6. F. A. Santos, "Firmware and hardware developer - ScientISST," 2023 - 2024. Instituto Telecomunicações

B.IV) SCIENTIFIC PROJECTS

I have been involved in 9 scientific projects as a researcher. These projects have been funded by national and international entities, namely FCT, P2020, and H2020. The projects have been developed in collaboration with several institutions, namely Fraunhofer Portugal, Xinhuanet, IST and IT.

Fundação Bial
RegularMente *2023 –*
Randomized Controlled Trial of the 2023 -– Effects of a Guided Imagery-based Intervention on the well-being, socioemotional and cognitive development, physiologic activity, and academic success of children in school.

Portugal 2020 (P2020), European Regional Development Fund
P2020 #69918, CardioLeather *2022 – 2023*
Intelligent Leather for Monitoring Health, Wellbeing, and Safety in Automotive Vehicles.

FCT – Fundação para a Ciência e Tecnologia
FCT PCIF/SSO/0163/2019, SafeFire *2021 – 2023*
Firefighter Uniforms with Integrated Human, and Environmental Monitoring for Promoting Occupational Health.

Portugal 2020 (P2020), European Regional Development Fund
P2020 #113480, EpilFootSense *2021 – 2023*
Intelligent textiles wearables for the detection of epileptic seizures.

IST – Instituto Superior Técnico
PIP 1018P.06044.1.01, ScientIST-SENSE *2021 – 2022*
IoT Hardware Platform to Support Study and Rapid Prototyping in Biomedical Engineering.

IT - Instituto deTelecomunicações
IT EEA/50008, NICE HOME *2020 – 2022*
Non-Invasive Fog-Cloud Enabled Home Monitoring for Elders.

XinhuaNet
S-0003-LX-18, XiPhy *2018 – 2020*
Xinhuanet Physiological Computing Scientific Research Cooperation.

Ministry of Eco. & Comp. of the Spanish Gov., Eur. Regional Devel. Fund
MEIC/ERDF TIN2017-85409-P, PhysComp *2018 – 2021*
Application of machine learning techniques to physiological Signals to facilitate user interaction and device control.

Associação Fraunhofer Portugal Research
NORTE-01-0145-FEDER-000026, Deus ex Machina *2019*
Symbiotic technology for societal efficiency gain.

C) KNOWLEDGE TRANSFER

Through the years, I have been involved in several projects, from the design of prototype devices to data collection in the real world, to the exploration of machine learning technologies based on physiological data. These endeavors highlight my commitment to applying academic research in practical settings, contributing to the development of innovative solutions and the advancement of knowledge in diverse fields.

C.I) CONSULTING

In addition to the activities disclosed under the research and development projects section, I have participated in consulting activities, namely in the areas of machine learning, signal processing, and data analysis. My involvement ranges from overseeing research initiatives to providing expert advice in the design and implementation of technology solutions.

Acting Emotions *2022 – 2024*
Descrip: Supervised the design of a public dataset for emotion recognition and the exploration of machine learning technologies based on physiological data.
Team: Luis Aly (INESC-TEC, Universidade do Porto), Leonor Godinho, G. Bernardes (INESC-TEC, Universidade do Porto), and Hugo Silva (IST-UL).

Design Process of a Constant Epilepsy Monitoring Wearable Device *2023*
Descrip: Assisted in the data collection of electrodermal activity, and the design of a prototype for Epilepsy monitoring.
Team: Mafalda Morgado (Faculdade de Design, Tecnologia e Comunicação), Joana Brito (IT), and Hugo Silva (IST-UL).

C.II) DISSEMINATION

In addition to my academic activities, I have been involved in outreach activities such as workshops, talks, and scientific fairs, underscoring my dedication to spreading knowledge, enhancing scientific understanding, and community engagement. These efforts have enabled me to exchange ideas with a varied audience, contributing significantly to dialogues in my field while also drawing inspiration and learning from these interactions.

Invited Speaker

1. **P. Bota** and d. S. H. P., "Emotion assessment in the wild," in *Modern Technologies Enabling Innovative Methods for Maritime Monitoring and Strengthening Resilience in Maritime Critical Infrastructures*, (Lisbon, Portugal), Jan 2024
2. **P. Bota** and A. Ferreira, "What do your biosignals say about you," in *INBIO (Introdução aos Bio-sinais)*, (Lisbon, Portugal), Jul 2023
3. **P. Bota**, M. Abreu, and H. P. da Silva, "Introduction to machine learning and applications," in *Exercise Prescription and Health Promotion*, (Instituto Politécnico de Leiria, Leiria, Portugal), Feb 2020

Workshops

1. **P. Bota** and J. Brito, "EmotiphAI: How to detect emotions in a group of people," in *Maker Faire*, (Lisbon, Portugal), Feb 2023
2. **P. Bota**, H. P. da Silva, and M. Abreu, "Introduction to biosignal acquisition," in *1st Int'l Meeting of the Portuguese Society of Physiology*, (Lisbon, Portugal), Oct 2019
3. **P. Bota** and M. Abreu, "Signal processing and machine learning," in *summer course of CEiiA (Centre of Engineering and Product Development)*, (Instituto Superior Técnico, Lisbon, Portugal), Jul 2020
4. **P. Bota** and M. Abreu, "Introduction to machine learning and applications," in *Clynx*, (online), Jul 2020
5. **P. Bota** and M. Abreu, "Physiological signal classification," in *Congress of the Brazilian Society of Physiology*, (online), Sep 2020
6. **P. Bota**, D. Folgado, and R. Varandas, "Machine learning and TSFEL hands-on workshop," in *Fraunhofer Lisbon*, (Lisbon, Portugal), Jan 2019

Scientific Fairs

1. **P. Bota**, A. S. Carmo, M. Abreu, and S. Monteiro, "EmotiphAI and IT group projects showcase." Noite Europeia dos Investigadores, Sep 2023

2. **P. Bota** and A. M., "EmotiphAI and IT group projects showcase." Dia Internacional das Raparigas nas Tecnologias de Informação e Comunicação, Apr 2023

3. **P. Bota**, J. Brito, R.Silva, and V. Garção, "Biosignals acquisition and visualisation." FIC.A (International Festival of Science), Oct 2022

4. **P. Bota**, S. Monteiro, L. Pereira, R. Silva, and R. Maciel, "EmotiphAI and it group projects showcase." 22nd anniversary of Campus Tagus-park, Nov 2022

5. **P. Bota** and M. Abreu, "Dissemination of FMCI xinhuanet signal acquisition devices." Web Summit, Lisbon, Portugal, Nov 2019. In collaboration with Xinhuanet FMCI

Showcases

Online theatre as a research instrument *14 Jun 2022*
Descrip:: Experiment to find a method of collecting feedback from viewers on an online event. How to collect data, synchronize it with a recording, analyze and draw conclusions about the success of an event. I was involved in developing the infrastructure for the audience's physiological data collection.
Team: Taavet Jansen (UTallinn), Aleksander Väljamäe, Joana Brito (IT), and Hugo Silva (IST-UL/IT)

DataWe *14-19 Oct 2019*
Descrip:: A neurocinematic system for studying collective decision-making shown at the European Commission Joint Research Centre Ispra Sector, Italy. I was involved in developing the infrastructure for the audience's physiological data collection.
Team: Taavet Jansen (UTallinn), Aleksander Väljamäe (Univ. of Tartu), Anu Almik, and Hugo Silva (IST-UL/IT)

Opera Experience *2020*
Descrip:: Experiment to analyze an audience response to a live Opera show at ESMAE. I was involved in developing the infrastructure for the audience's physiological data collection.
Team: Ana Rosado (ESMAE), António Salgado (ESMAE), and Hugo Silva (IST-UL/IT)

Peer Reviews

International Association for Pattern Recognition (ICPR) *2022*
Quant: 3

IEEE Trans. Affective Computing *2024*
Quant: 1