JOÃO RIBEIRO PINTO

Researcher in Pattern Recognition

Born: January 26th, 1994, in Vila Real, Portugal

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Google Scholar: https://scholar.google.pt/citations?user=hhF9Q8kAAAAJ

Publons: https://publons.com/author/1450970/joao-ribeiro-pinto

About me: I hold an integrated master degree in Bioengineering - Biomedical Engineering, and I am now pursuing a Ph.D. degree in Electrical and Computers Engineering. I have studied a wide array of subjects such as sensors, electronics, signal processing, image analysis, programming, biomechanics, robotics, bionics, and entrepreneurship. Currently, as Research Assistant at the Visual Computing and Machine Learning research group of INESC TEC, I work on signal processing, computer vision, and pattern recognition for continuous biometric recognition and well-being monitoring. I am especially focused mainly on the use of ECG signals from off-the-person, unconstrained, and seamless acquisition settings. Besides pattern recognition, I am very passionate about graphic design, web development, history, geography, vexillology, heraldry, and politics.

Current positions

since 10/2018   **Ph.D. Student**, Faculdade de Engenharia da Universidade do Porto (FEUP)

since 10/2017   **Research Assistant**, Centre for Telecommunications and Multimedia – INESC TEC

Education

since 2018   **Doctoral Programme in Electrical and Computers Engineering**
Faculdade de Engenharia da Universidade do Porto
Thesis: *Seamless Multimodal Biometrics for Continuous Personalised Wellbeing Monitoring*
Supervisors: Prof. Dr. Jaime S. Cardoso (INESC TEC) & Prof. Dr. Miguel V. Correia (INESC TEC)

2014–2017   **Integrated Master in Bioengineering – Biomedical Engineering**
Faculdade de Engenharia da Universidade do Porto, Portugal
Integrated Bachelor & Master degree (grade 16 out of 20)
Dissertation: *Continuous Biometric Identification on the Steering Wheel*
Supervisors: Prof. Dr. Jaime S. Cardoso (FEUP) & Prof. Dr. André Lourenço (CardioID Technologies)

Research activity

since 10/2018   **Ph.D. Scholarship** for research on pattern recognition for multimodal biometrics and well-being monitoring
Fundação para a Ciência e Tecnologia, IP (FCT), Portugal

01–09/2018   **M.Sc. Scholarship** on image analysis for archive documents and media content (CHIC project)
Faculdade de Engenharia da Universidade do Porto, Portugal

08–12/2017   **M.Sc. Scholarship** on deep learning for electrocardiogram biometric identification
Faculdade de Engenharia da Universidade do Porto, Portugal

2016–2017   **M.Sc. Thesis Student and Intern** on off-the-person continuous ECG biometrics
CardioID Technologies Lda., Portugal

Current areas of expertise and research interests

Biometrics: seamless/unconstrained/off-the-person biometrics, physiological traits
Well-being monitoring: wearables, seamless acquisition, continuous monitoring, quantified self
Pattern recognition: computer-aided diagnosis, signal processing, image analysis, machine & deep learning

Scientific publications

JOURNAL ARTICLES (3)

2018   J. R. Pinto, J. S. Cardoso, and A. Lourenço, "**Evolution, Current Challenges, and Future Possibilities in ECG Biometrics**," *IEEE Access* 6: 34746–34776. `doi:10.1109/ACCESS.2018.2849870`

2017   J. R. Pinto, J. S. Cardoso, A. Lourenço, and C. Carreiras, "**Towards a Continuous Biometric System Based on ECG Signals Acquired on the Steering Wheel**," *Sensors* 17 (10): 2228. `doi:10.3390/s17102228`

2017   J. R. Pinto and J. M. R. S. Tavares, "**A versatile method for bladder segmentation in computed tomography two-dimensional images under adverse conditions**," *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine* 231 (9): 871–880. `doi:10.1177/0954411917714294`

INTERNATIONAL CONFERENCE ARTICLES (3)

2019   J. R. Pinto and J. S. Cardoso, "**An End-to-End Convolutional Neural Network for ECG-Based Biometric Authentication**," in *10th IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS)*, 23–26 September, Tampa FL, United States. (*in press*)

2019   G. Lopes, J. R. Pinto, and J. S. Cardoso, "**Don't You Forget About Me: A Study on Long-Term Performance in ECG Biometrics**," in *IbPRIA 2019: 9th Iberian Conference on Pattern Recognition and Image Analysis*, 1–4 July, Madrid, Spain. `doi:10.1007/978-3-030-31321-0_4`

2018   W. Silva, J. R. Pinto, and J. S. Cardoso, "**A Uniform Performance Index for Ordinal Classification with Imbalanced Classes**," in *Proceedings of the 2018 International Joint Conference on Neural Networks (IJCNN)*, 8–13 July, Rio de Janeiro, Brazil. `doi:10.1109/IJCNN.2018.8489327`

BOOK CHAPTERS (1)

2019   J. R. Pinto, J. S. Cardoso, and A. Lourenço, "**Deep Neural Networks for Biometric Identification Based on Non-Intrusive ECG Acquisitions**," in K. V. Arya and R. S. Bhadoria, Eds., *The Biometric Computing: Recognition and Registration*, Boca Raton, FL, USA: CRC Press, `ISBN:978-0-8153-9364-1` (*in press*)

NATIONAL CONFERENCE ARTICLES (4)

2019   J. R. Pinto and J. S. Cardoso, "**Fine Segmentation of Head and Torso Using Label Refinement Networks**," in *25th Portuguese Conference on Pattern Recognition (RECPAD 2019)*, 31 October, Porto, Portugal.

2019   G. Lopes, J. R. Pinto, J. S. Cardoso, and A. Rebelo, "**Long-Term Performance of a Convolutional Neural Network for ECG-Based Biometrics**," in *25th Portuguese Conference on Pattern Recognition (RECPAD 2019)*, 31 October, Porto, Portugal.

2019   P. Costa, P. Silva, J. R. Pinto, A. F. Sequeira, and A. Rebelo, "**Face Anti Spoofing: Handcrafted and Learned Features for Face Liveness Detection**," in *25th Portuguese Conference on Pattern Recognition (RECPAD 2019)*, 31 October, Porto, Portugal.

2018   J. R. Pinto, J. S. Cardoso, and A. Lourenço, "**Improving ECG-Based Biometric Identification Using End-to-End Convolutional Networks**," in *24th Portuguese Conference on Pattern Recognition (RECPAD 2018)*, 26 October, Coimbra, Portugal.

2019   J. R. Pinto, **"Continuous Biometric Identification on the Steering Wheel,"** Master's Dissertation, Universidade do Porto.

Citation record

49 citations   h-index **2**   i10-index **2**   (according to Google Scholar, 01/11/2019)

Student supervision

Master's Dissertations (4 students)

2020   **Co-supervisor** of Leonardo G. Capozzi, *Face Recognition For Forensic Applications: Methods for Matching Facial Sketches to Mugshot Pictures*, Master in Informatics and Computing Engineering, Universidade do Porto (2019–2020)

2020   **Co-supervisor** of Arthur J. Matta, *Deep Learning For Face Recognition: A Real-Time Face Biometric Recognition System*, Master in Informatics and Computing Engineering, Universidade do Porto (2019–2020)

2020   **Co-supervisor** of Carolina M. B. R. Afonso, *Changing Perspectives: Interlead Conversion in Electrocardiographic Signals*, Master in Network and Information Systems Engineering, Universidade do Porto (2019–2020)

2019   **Co-supervisor** of Gabriel C. Lopes, *Don't You Forget About Me: Enhancing Long Term Performance in Electrocardiogram Biometrics*, Master in Bioengineering, Universidade do Porto (17/09/2018–17/07/2019)

Internships (9 students)

2019   **Co-supervisor** of Pedro Silva, Paulo Costa, Manuel Curral, Gil Teixeira, Pedro Neto, Martim Silva, João Mendes, João Moura, and Carolina Afonso, *CTM Summer Internships*, at INESC TEC, Porto, Portugal (03/07/2019 – 02/08/2019)

Editorial and scientific event contributions

2020   **Project Committee Member** for *VISUM 2020* summer school, Porto, Portugal
2020   **Demo Chair** for *IWBF 2020* international workshop, Porto, Portugal
2019   **Program Committee Member** for *MEDICON 2019* conference, Coimbra, Portugal
2019   **Special Session Co-Organiser** for *CIBB 2019* conference, Bergamo, Italy
2019   **Co-supervisor** on *CTM Summer Internships*, Porto, Portugal
2019   **Project Committee Member** at *VISUM 2019* summer school, Porto, Portugal
2017   **Communication and Image Team Member** at *8th Symposium in Bioengineering*, Porto, Portugal

Peer review record

Journals (12 manuscripts)

2019   ○ MDPI's *Sensors* (1);
     ○ IEEE's *Transactions in Information Forensics and Security (TIFS)* (2);
     ○ MDPI's *Algorithms* (1);
     ○ MDPI's *Electronics* (1);
     ○ MDPI's *Applied Sciences* (3);
     ○ Elsevier's *Biocybernetics and Biomedical Engineering (BBE)* (1);
     ○ Sage's *Journal of Engineering in Medicine* (1);
     ○ IEEE's *Access* (1).
2018   ○ MDPI's *Sensors* (1).

Conferences (17 manuscripts)

2019   ○ *CIBB 2019* conference, Bergamo, Italy (4);
     ○ *MEDICON 2019* conference, Coimbra, Portugal (5);
     ○ *IEEE ENBENG 2019* conference, Lisbon, Portugal (4).
2018   ○ *IEEE BIOCAS 2018* conference, Cleveland, OH, United States (2);
     ○ *CIBB 2018* conference, Lisbon, Portugal (2).

Professional societies

since 2015	Student Member at **IEEE** (Institute of Electrical and Electronics Engineers)
since 2017	Student Member at **Ordem dos Engenheiros** (official portuguese engineering society)

Voluntary and extracurricular activities

2019	**Workshop Co-organiser** at CTM Open Day 2019
2016–2017	**Communication and Image Collaborator** at NEB-FEUP/ICBAS (Bioengineering students association)
2015–2017	**Vice-Chair** at EMBS UP (IEEE Engineering in Medicine and Biology student chapter)
2015–2017	**Member** at NuIEEE (IEEE student branch at Universidade do Porto)
2015–2016	**Student Researcher** at VILab (informal computer vision research group for students)
2014–2015	**Marketing Team Member** at BEST Porto (european engineering student group)

Programming knowledge

Most used

Python: numpy, scipy, scikit-learn, scikit-image, pandas, keras, pytorch
Matlab: including signal processing, image analysis, and machine learning tools
Web development: HTML5, CSS3, PHP, SQL

Basic knowledge

C/C++: object-oriented programming
Java: including Android mobile application development
Web development: Javascript, Bootstrap, jQuery
LabVIEW: signal acquisition, processing, and control

Briefly used

R: for bioinformatics programming
Web development: ReactJS, AngularJS, Sass, C#, .NET

Language proficiency

Portuguese – Native language
English – Full professional proficiency