JOÃO RIBEIRO PINTO

jtrpinto@gmail.com
(+351) 912 973 549
Braga, Portugal
in/jtrpinto
0000-0003-4956-5902
user=hhF9Q8kAAAAJ
profile/Joao_Ribeiro_Pinto

About me:

Hi, I'm João! I have been working on biometrics and computer vision, especially on autonomous vehicle scenarios, contributing to fundamental knowledge and creating solutions to real-life problems. I am looking to use my experience to build practical and innovative AI solutions to real-life problems in exciting new projects. I am passionate about innovation, taking AI from research to reality, leading teams and mentoring students. Beyond work, I love design, history, geography, heraldry, languages, and everything related to world cultures.

TOP SKILLS

Creative, self-driven, and resilient;
Teamwork and autonomy;
Always searching for realistic results;
Multidisciplinary background;
Communication (oral and written);
Leading and mentoring people.

STATS

42 publications
11 journal papers
18 int. conference papers
550+ citations
16 M.Sc. supervisions
20+ supervised interns
15 scientific events
130+ papers reviewed

more info at
jtrpinto.github.io

EDUCATION

Ph.D. in Electrical and Computers Engineering — 2022

University of Porto, Portugal

- Research on biometrics, wellbeing monitoring, & other ML/CV topics;
- Authored 38 scientific articles within my doctoral studies;
- Received the Max Snijder 2022 Award - European Association for Biometrics.

M.Sc. in Bioengineering - Biomedical Engineering — 2017

University of Porto, Portugal

- Strong foundations on biomedical eng., programming, and computer vision;
- Published two journal articles, on medical image analysis and biometrics.

EXPERIENCE

AI for Autonomous Driving

Senior Deep Learning Researcher - Bosch Portugal — **since 04/2022, 1yr. 2m.**

- Techical co-lead for a sub-project on computing and data infrastructure, security, and privacy solutions for autonomous vehicles;
- Implemented and improved solutions for LiDAR point cloud-based road lane estimation and semantic segmentation for autonomous driving scenarios;
- Supervised 3 master thesis internships on AI for lane estimation, data anonymisation, and deep implicit representations.

Biometrics and Computer Vision R&D

Research Assistant - INESC TEC — **10/2017 - 04/2022, 4yr. 6m.**

- Conceptualized and implemented a novel method for biometric security in deep learning - simpler, faster, and lighter than the alternatives while attaining improved performance - received 2 best paper/presentation awards;
- Explored algorithm architectures for diverse tasks such as classification, semantic segmentation, content retrieval, object detection - authored 36 publications to date, cited over 260 times, and received 3 awards;
- Supervised 13 master theses and managed over 20 internship projects in several topics related to computer vision, signal processing, and machine learning.

Research Scholar - FEUP — **08/2017-09/2018, 1yr. 2m.**

- Designed the first end-to-end deep learning model for ECG biometrics, complete with data augmentation and transfer learning strategies, achieving error rates 56% inferior to the existing alternatives.

In-Vehicle Driver and Passenger Monitoring

Collaborator - Easy Ride Project SP5 — **02/2020-12/2021, 1yr. 11m.**

- Developed temporal neural networks for emotion and activity monitoring in autonomous shared vehicles (including audio and RGB sensor fusion). Led the process from conceptualization to deployment in collaboration with Bosch Car Multimedia;
- Demonstrated the violence detection algorithm, in-vehicle and in real-time, live at the NeXT Driving Tomorrow event.

Collaborator - AUTOMOTIVE Project — **07/2019-11/2021, 2yr. 4m.**

- Developed novel, robust, and optimized algorithms for ECG and face biometrics to enable the next generation of personalized driver drowsiness monitoring.

Digital Signal Processing and Machine Learning Development

M.Sc. Thesis Intern - CardioID Technologies — **07/2016-07/2017, 1yr. 1m.**

- Compiled the most complete survey on ECG biometrics to date (+100 citations);
- Autonomously developed a complete machine learning solution for seamless and accurate vehicle driver biometrics in challenging settings;
- Comprehensively benchmarked ECG biometric algorithms in realistic edge scenarios, step-by-step, from digital signal processing to decision.

SELECTED PUBLICATIONS

Electrocardiogram Lead Conversion from Single-Lead Blindly-Segmented Signals

- in *BMC Medical Informatics and Decision Making*, 2021
- The first study on ECG signal lead conversion from single-lead blindly-segmented inputs.

Secure Triplet Loss: Achieving Cancelability and Non-Linkability in End-to-End Deep Biometrics

- in *IEEE Transactions on Biometrics, Behavior and Identity Science*, 2021
- The first loss function designed to teach end-to-end deep learning models to learn biometric security.

Self-Learning with Stochastic Triplet Loss

- at *IJCNN 2020*
- An adaptation of triplet loss to learn without labels, especially fit for multiclass datasets and continuous/sequential data.

Explaining ECG Biometrics: Is It All In The QRS?

- at *BIOSIG 2020*
- The first study of explainability/interpretability for ECG biometrics.

(selected among a current total of 42 publications, cited over 470 times)

An End-to-End Convolutional Neural Network for ECG-Based Biometric Authentication

- at *BTAS 2019*
- The first end-to-end deep methodology for ECG biometric identity verification, with significant performance improvements on realistic scenarios.

Evolution, Current Challenges, and Future Possibilities in ECG Biometrics

- in *IEEE Access*, 2018
- The largest and most comprehensive survey of ECG biometric literature to date.

(selected among a current total of 42 publications, cited over 550 times)

VOLUNTEERING

Event Organization

VISUM Summer School **2019-2022, 4 eds.**

- Helped guide teams of students on lectures and challenges; developed and maintained the website; created marketing materials; managed social media.

xAI4Biometrics Workshop @ WACV **2021-2022, 2 eds.**

- Created and maintained the website; designed promotional materials.

IWBF (Int. Workshop on Biometrics and Forensics) **2020, 1 ed.**

- Led the organization of live demonstrations during the conference; developed a software tool for virtual poster presentations.

CIBB (Int. Conference on Bioinformatics and Biostatistics) **2019-2023, 3 eds.**

- Co-organised a special session on machine learning (2019, 2021, 2023); member of the conference technical programme committee (2021).

Symposium on Bioengineering **2017-2022, 3 eds.**

- Organized as part of the communication and image team (2017); led workshops on deep learning (2021, 2022); invited to be speaker (2022).

AWARDS

EAB Max Snijder Award 2022
Best PhD student NIS 2021
Best paper IWBF 2020
Best session paper IPAS 2020
Health Essay Award UCP 2012

TECH STACK

MOST USED:

Python **PyTorch** **Keras/Tensorflow** **OpenCV** **Pillow** **Scikit-Learn** **Scikit-Image** **Pandas** **MATLAB** **HTML** **CSS** **PHP** **SQL** **Javascript**

BASIC KNOWLEDGE:

C/C++ **Java** **Android** **jQuery**

LANGUAGES

Portuguese (Native)
English (Fluent)