



## Tiago Filipe Sousa Gonçalves

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I received my MSc in Bioengineering (Biomedical Engineering) from Faculdade de Engenharia da Universidade do Porto (FEUP) in 2019. Currently, I am a PhD Candidate in Electrical and Computer Engineering at FEUP and a research assistant at the Centre for Telecommunications and Multimedia of INESC TEC with the Visual Computing & Machine Intelligence (VCMI) Research Group. My research interests include machine learning, explainable artificial intelligence (in-model approaches), computer vision, medical decision support systems, and machine learning deployment.

Besides working, I enjoy practising Karate-Do Shotokai or reading about life, philosophy, economy, politics or fundamental science. Moreover, I do not refuse a good TV series or a good film (preferably at the cinema).

### Experience

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2023 – Present

#### Visiting PhD Student

Athinoula A. Martinos Center for Biomedical Imaging | Massachusetts General Hospital

- Visiting PhD student with The Quantitative Translational Imaging in Medicine Lab (QTIM), under the supervision of Albert Kim and Christopher Bridge

2021 – Present

#### Invited Teaching Assistant

Faculty of Engineering | University of Porto

- Invited Teaching Assistant during the 1st Semester of 2022-2023 on the course PRO - Programming (L.EEC004)
- Invited Teaching Assistant during the 1st Semester of 2021-2022 on the course TAIA - Advanced Topics on Artificial Intelligence

2020 – Present

#### Research Assistant

INESC TEC | Centre for Telecommunications and Multimedia

2019 – 2020

#### Research Assistant

Faculty of Engineering | University of Porto

2018 – 2018

#### Junior Researcher

Fraunhofer Portugal AICOS

### Education

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2020 – Present

#### Doctor of Philosophy Electrical and Computer Engineering

Faculty of Engineering | University of Porto

- Thesis Title: "Interpretable Machine Learning and its Application to Medical Decision Support Systems"

2016 – 2019

#### Bachelor of Science & Master of Science Bioengineering – Biomedical Engineering

Faculty of Engineering | University of Porto

- Thesis Title: "Deep Aesthetic Assessment of Breast Cancer Surgery Outcomes"

2013 – 2016 **Bachelor of Science**  
**Bioengineering – Biomedical Engineering**  
Faculty of Biotechnology | Universidade Católica Portuguesa

#### Awards

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- 2021 **MICCAI Hackathon 2021 Best Contribution Award**
- Member of the winning team "HIT" (Helena Montenegro, Isabel Rio-Torto, João Nunes and Tiago Gonçalves) with the work titled "Show Me Consistency! Increasing the quality and consistency of annotations"
- 2021 **2<sup>nd</sup> Place World Data League**
- Member of the team "Tech Moguls" (Joana Morgado, Paulo Maia, Tiago Gonçalves and Tomé Albuquerque) that achieved 2nd place at the World Data League competition on data science

#### Extracurricular Activities

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- 2023 – Present **INvicta school of VIsion, Computational intelligence, and patTern Analysis (INVICTA) Spring School 2024**
- Member of the Organising Committee
- 2021 – 2022 **VISion Understanding and Machine intelligence (VISUM) Summer School 2022**
- Leader of the Project Committee
  - Member of the Organising Committee
- 2021 – 2022 **2<sup>nd</sup> Workshop on Explainable & Interpretable Artificial Intelligence for Biometrics at WACV 2022**
- Member of the Organising Committee
  - Sponsorship Co-chair
- 2020 – 2021 **VISion Understanding and Machine intelligence (VISUM) Summer School 2021**
- Member of the Organising Committee
  - Member of the Project Committee
- 2020 – 2021 **1<sup>st</sup> Workshop on Explainable & Interpretable Artificial Intelligence for Biometrics at WACV 2021**
- Member of the Organising Committee
  - Sponsorship Co-chair
- 2019 – 2020 **VISion Understanding and Machine intelligence (VISUM) Summer School 2020**
- Member of the Organising Committee
- 2020 – 2021 **Conselho Nacional de Debates Universitários (Portuguese Universities Debating Council)**
- Treasurer of the Board of Directors
- 2019 – 2021 **Sociedade de Debates da Universidade do Porto (University of Porto Debate Society)**
- President of the Audit Committee
  - Treasurer of the Board of Directors
- 2017 – 2019 **Associação Nacional de Estudantes de Engenharia Biomédica (Portuguese Biomedical Engineering Students' Association)**
- Treasurer of the Board of Directors
  - Founder and Secretary of the General Assembly

2017 – Present	<b>European Students, Sustainability Auditing (ESSA Project)</b> <ul style="list-style-type: none"> <li>• Social Responsibility Student Auditor</li> </ul>
2017 – 2019	<b>ShARE-UP</b> <ul style="list-style-type: none"> <li>• President of the Board of Directors</li> <li>• Network Manager of the Energy Network</li> </ul>
2016 – 2017	<b>Uniplaces</b> <ul style="list-style-type: none"> <li>• Uniplaces Academy – Ambassador Program</li> <li>• University Partnerships Manager Porto</li> <li>• Creative &amp; Social Media Manager Porto</li> </ul>
2016 – 2018	<b>Núcleo de Estudantes de Bioengenharia FEUP/ICBAS (Bioengineering Student Association FEUP/ICBAS)</b> <ul style="list-style-type: none"> <li>• Member of the Communication and Image Department</li> </ul>
2013 – 2016	<b>Associação de Estudantes da Escola Superior de Biotecnologia (Student's Union of the Faculty of Biotechnology)</b> <ul style="list-style-type: none"> <li>• Treasurer of the Board of Directors</li> <li>• Vice-President of the Board of Directors</li> </ul>
2013 – 2016	<b>Sociedade de Debates da Católica Porto (Católica Porto Debate Society)</b> <ul style="list-style-type: none"> <li>• President of the Audit Committee</li> <li>• Founder and President of the Board of Directors</li> </ul>
2013 – 2021	<b>Tuna da Universidade Católica Portuguesa – Porto (Academic Band of Universidade Católica Portuguesa – Porto)</b> <ul style="list-style-type: none"> <li>• President of the Audit Committee</li> <li>• Vice-President of the General Assembly</li> <li>• Vice-President of the Board of Directors</li> <li>• Vice-President of the Audit Committee</li> </ul>
2015 – 2016	<b>Erasmus+ Buddy (Faculty of Biotechnology)</b> <ul style="list-style-type: none"> <li>• Member of the Erasmus+ Buddy Committee</li> </ul>
2013 – 2014	<b>Clube de Investigadores – Escola Superior de Biotecnologia (Researchers Club – Faculty of Biotechnology)</b> <ul style="list-style-type: none"> <li>• Project “Bacteria around the City”, under the supervision of Professor Célia Manaia</li> </ul>
2013 – 2016	<b>Programa de Mentorado – Escola Superior de Biotecnologia (Mentorship Programme – Faculty of Biotechnology)</b> <ul style="list-style-type: none"> <li>• Mentorship Programme under the supervision of the Alumnus José Carlos Pereira</li> </ul>
2014 – 2015	<b>Jornadas de Biotecnologia – Escola Superior de Biotecnologia (Journeys of Biotechnology – Faculty of Biotechnology)</b> <ul style="list-style-type: none"> <li>• Treasurer of the Organising Committee</li> <li>• BSc Representative of the Organising Committee</li> </ul>

## Technical Skills

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Programming Languages	<ul style="list-style-type: none"> <li>• Python</li> <li>• MATLAB</li> <li>• JavaScript</li> <li>• C/C++</li> <li>• HTML</li> <li>• CSS</li> </ul>
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Programming Frameworks	<ul style="list-style-type: none"> <li>• Bootstrap</li> <li>• Wordpress</li> <li>• Django</li> </ul>
Technologies	<ul style="list-style-type: none"> <li>• Docker</li> </ul>
<b>Personal Skills</b>	
Languages Known	<ul style="list-style-type: none"> <li>• Portuguese: Reading (Native), Writing (Native), Speaking (Native)</li> <li>• English: Reading (Excellent), Writing (Excellent), Speaking (Excellent)</li> <li>• French: Reading (Fair), Writing (Fair), Speaking (Fair)</li> <li>• Spanish: Reading (Fair), Writing (Fair), Speaking (Fair)</li> </ul>
<b>Publications</b>	
International Conference and Journal Articles	<ol style="list-style-type: none"> <li>1. Ricardo Cruz, Diana Teixeira e Silva, Tiago Gonçalves, Diogo Carneiro, and Jaime S. Cardoso. Two-Stage Framework for Faster Semantic Segmentation. <i>Sensors</i>, 23(6), 2023</li> <li>2. Diana Teixeira e Silva, Ricardo Cruz, Tiago Gonçalves, and Diogo Carneiro. Two-stage semantic segmentation in neural networks. In Wolfgang Osten, Dmitry P. Nikolaev, and Jianhong (Jessica) Zhou, editors, <i>Fifteenth International Conference on Machine Vision (ICMV 2022)</i>, volume 12701, page 127010G. International Society for Optics and Photonics, SPIE, 2023</li> <li>3. Tiago Gonçalves, Isabel Rio-Torto, Luís F. Teixeira, and Jaime S. Cardoso. A survey on attention mechanisms for medical applications: are we moving toward better algorithms? <i>IEEE Access</i>, 10:98909–98935, 2022</li> <li>4. Pedro C. Neto, Tiago Gonçalves, Marco Huber, Naser Damer, Ana F. Sequeira, and Jaime S. Cardoso. Orthomad: Morphing attack detection through orthogonal identity disentanglement. In <i>2022 International Conference of the Biometrics Special Interest Group (BIOSIG)</i>, pages 1–5, 2022</li> <li>5. Ana F Sequeira, Tiago Gonçalves, Wilson Silva, João Ribeiro Pinto, and Jaime S Cardoso. An exploratory study of interpretability for face presentation attack detection. <i>IET Biometrics</i>, 10(4):441–455, 2021</li> <li>6. João Ribeiro Pinto, Tiago Gonçalves, Carolina Pinto, Luís Sanhudo, Joaquim Fonseca, Filipe Gonçalves, Pedro Carvalho, and Jaime S Cardoso. Audiovisual classification of group emotion valence using activity recognition networks. In <i>2020 IEEE 4th International Conference on Image Processing, Applications and Systems (IPAS)</i>, pages 114–119. IEEE, 2020</li> <li>7. Tiago Gonçalves, Wilson Silva, Maria J Cardoso, and Jaime S Cardoso. Deep image segmentation for breast keypoint detection. In <i>Multidisciplinary Digital Publishing Institute Proceedings</i>, volume 54, page 35, 2020</li> <li>8. Sara P Oliveira, João Ribeiro Pinto, Tiago Gonçalves, Rita Canas-Marques, Maria-João Cardoso, Hélder P Oliveira, and Jaime S Cardoso. Weakly-supervised classification of her2 expression in breast cancer haematoxylin and eosin stained slides. <i>Applied Sciences</i>, 10(14):4728, 2020</li> <li>9. Ana F Sequeira, Wilson Silva, João Ribeiro Pinto, Tiago Gonçalves, and Jaime S Cardoso. Interpretable biometrics: Should we rethink how presentation attack detection is evaluated? In <i>2020 8th International Workshop on Biometrics and Forensics (IWBF)</i>, pages 1–6. IEEE, 2020</li> <li>10. Tiago Gonçalves, Wilson Silva, Maria J Cardoso, and Jaime S Cardoso. A novel approach to keypoint detection for the aesthetic evaluation of breast cancer surgery outcomes. <i>Health and Technology</i>, pages 1–13, 2020</li> <li>11. Tiago Gonçalves, Wilson Silva, and Jaime Cardoso. Deep aesthetic assessment of breast cancer surgery outcomes. In <i>Mediterranean Conference on Medical and Biological Engineering and Computing</i>, pages 1967–1983. Springer, 2019</li> </ol>