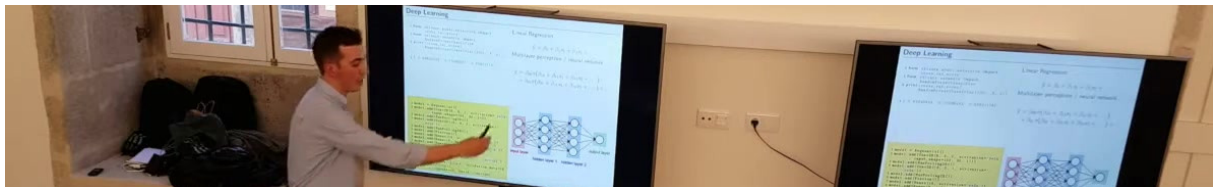


# Ricardo Cruz, PhD

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Ricardo Cruz received a B.S. degree in computer science and an M.S. degree in applied mathematics, both from the University of Porto, Portugal. Since 2015, he has been a researcher at INESC TEC working in machine learning with particular emphasis on computer vision. He earned his Ph.D. in Computer Science in 2021 with a special emphasis on computer vision and deep learning. Currently, he is a post-doctoral researcher on autonomous driving under the THEIA research project, a partnership between the University of Porto and Bosch Car Multimedia.

SKILLS: Python · C · C++ · Java · R · MATLAB · PyTorch · TensorFlow · OpenCV · SQL · Git



## EDUCATION

**2021 Ph.D.** Computer Science (joint degree University of Porto, Minho and Aveiro)  
**2015 M.Sc.** Mathematical Engineering (University of Porto)  
**2012 B.Sc.** Computer Science (University of Porto)

## EMPLOYMENT

**2021–...** **Post-doctoral Researcher** on Autonomous Driving University of Porto (FEUP) [in partnership with Bosch]  
**2015–2021** **Research Assistant** on Machine Learning and Computer Vision INESC TEC  
**2014** **Research Grant** on Mathematical Modelling Research Mathematics Center of the University of Porto (CMUP)

## TEACHING

**2021–2022** **Invited Auxiliary Professor**, University of Porto (FEUP)  
**2018–2021** **Invited Teacher Assistant**, University of Porto (FEUP)

## COURSES

The teaching consisted of the practical lessons (2h-4h per week) and helping with the materials.

- L.EIC003: Programming Fundamentals (Python) [L.EIC] (2018/2019, 2019/2020, 2020/2021, 2021/2022)
- L.EIC009: Programming (C/C++) [L.EIC] (2019/2020, 2020/2021)
- L.EEC009: Data Structures and Algorithms (C/C++) [L.EEC] (2021/2022)



## AWARDS

- 2022 **Bosch for Mobility:** My students won Best New Participating Team in an autonomous driving competition [↗](#)
- 2021 **INESC TEC Outstanding Recognition Award:** Monthly award for INESC TEC collaborators, for maintenance of the HPC infrastructure [↗](#)
- 2021 **Pedagogic award (voted by students):** University of Porto (FEUP)
- 2021 **Best paper and presentation:** RECPAD conference [↗](#)
- 2018 INESC TEC Outstanding Recognition Award: Monthly award for INESC TEC collaborators, for organizing workshops [↗](#)
- 2017 **Kaggle Bronze Medal (competition) and Silver (engagement)**



## PARTICIPATION IN SCIENTIFIC PROJECTS

- **THEIA** – Automated Perception Driving (POCI-01-0247-FEDER-047264)
- **CLARE** – Computer-aided cervical cancer screening (POCI-01-0145-FEDER-028857) [↗](#)
- **NanoSTIMA** Macro-to-Nano Human Sensing: Towards Integrated Multimodal Health Monitoring and Analytics (NORTE-01-0145-FEDER-000016)



## IMPACT AND CITATIONS

- Google Scholar (may/2023): 171 citations, 7 h-index [↗](#)
- Web of Science (may/2023): 73 citations, 4 h-index [↗](#)
- Scopus (may/2023): 111 citations, 5 h-index [↗](#)



## JOURNAL PUBLICATIONS

1. **R. Cruz**, D. Silva, T. Gonçalves, D. Carneiro, J. Cardoso (2023). Two-Stage Framework for Faster Semantic Segmentation. *MDPI Sensors* [↗](#)
2. T. Albuquerque, L. Rosado, **R. Cruz**, M. Vasconcelos, T. Oliveira, J. Cardoso (2023). Rethinking Low-Cost Microscopy Workflow: Image Enhancement using Deep Based Extended Depth of Field Methods. *Elsevier Intelligent Systems with Applications* [↗](#)
3. T. Albuquerque, **R. Cruz**, J. Cardoso (2022). Quasi-Unimodal Distributions for Ordinal Classification. *MDPI Mathematics* [↗](#)
4. T. Albuquerque, **R. Cruz**, J. Cardoso (2021). Ordinal Losses for Classification of Cervical Cancer Risk. *PeerJ Computer Science* [↗](#)
5. R. Prates, **R. Cruz**, A. Marotta, R. Ramos, E. Filho, J. Cardoso (2019). Insulator visual non-conformity detection in overhead power distribution lines using deep learning. *Springer Journal Computers & Electrical Engineering* [↗](#)
6. **R. Cruz**, K. Fernandes, J. Costa, M. Pérez Ortiz, J. Cardoso (2018). Binary ranking for ordinal class imbalance. *Springer Journal Pattern Analysis and Applications* [↗](#)



## CONFERENCE PUBLICATIONS

My favorite publications are in **highlight**.

1. P. S. Silva, **R. Cruz**, ASM Shihavuddin, T. Gonçalves (2023) **[ACCEPTED]**. Interpretability-Guided Human Feedback During Neural Network Training. *Springer Iberian conference on pattern recognition and image analysis (Ibpria)*

2. D. Silva, **R. Cruz**, T. Gonçalves, D. Carneiro (2022) [ACCEPTED]. Two-stage Semantic Segmentation in Neural Networks. *Proceedings of the Fifteenth International Conference on Machine Vision (ICMV)* [↗](#)
3. **R. Cruz**, R. Prates, E. Filho, J. Costa, J. Cardoso (2021). Background Invariance by Adversarial Learning. *IEEE 25th International Conference on Pattern Recognition (ICPR)* [↗](#)
4. **R. Cruz**, J. Costa, J. Cardoso (2019). Automatic Augmentation by Hill Climbing. *Springer 28th International Conference on Artificial Neural Networks (ICANN)* [↗](#)
5. **R. Cruz**, J. Costa, J. Cardoso (2019). Averse Deep Semantic Segmentation. *IEEE 41st Engineering in Medicine and Biology Conference (EMBC)* [↗](#)
6. **R. Cruz**, M. Silveira, J. Cardoso (2018). A Class Imbalance Ordinal Method for Alzheimer's Disease Classification. *IEEE International Workshop on Pattern Recognition in Neuroimaging (PRNI)* [↗](#)
7. K. Fernandes, **R. Cruz**, J. Cardoso (2018). Deep image segmentation by quality inference. *IEEE International Joint Conference on Neural Networks (IJCNN)* [↗](#)
8. **R. Cruz**, K. Fernandes, J. Costa, J. Cardoso (2017). Constraining type II error: building intentionally biased classifiers. *Springer International Work-conference on Artificial Neural Networks (IWANN)* [↗](#)
9. M. Pérez-Ortiz, K. Fernandes, **R. Cruz**, J. Cardoso (2017). Fine-to-coarse ranking in ordinal and imbalanced domains: an application to liver transplantation. *Springer International Work-conference on Artificial Neural Networks (IWANN)* [↗](#)
10. **R. Cruz**, K. Fernandes, J. Costa, M. Pérez-Ortiz, J. Cardoso (2017). Combining ranking with traditional methods for ordinal class imbalance. *Springer International Work-conference on Artificial Neural Networks (IWANN)* [↗](#)
11. **R. Cruz**, K. Fernandes, J. Costa, M. Pérez-Ortiz, J. Cardoso (2017). Ordinal class imbalance with ranking. *Springer Iberian conference on pattern recognition and image analysis (Ibpria)* [↗](#)
12. **R. Cruz**, K. Fernandes, J. Costa, J. Cardoso (2016). Tackling class imbalance with ranking. *IEEE International Joint Conference on Neural Networks (IJCNN)* [↗](#)



## JURY PARTICIPATION

- 2022** Mafalda Oliveira: *Neuroblastoma Cancer Radiogenomics* (FEUP, External Examiner)
- 2022** João Pedro Fonseca: *AI-Based Models to Predict The Traumatic Brain Injury Outcome* (FEUP, External Examiner)
- 2022** Ana Maria Sousa: *Learning to write medical reports from EEG data* (FEUP, Chairman)
- 2022** Bruno Nascimento: *Detection and classification of small impacts on vehicles based on deep learning algorithms* (U. Minho, External Examiner)
- 2021** Artur Ferreira: *3D Lung Computed Tomography Synthesis using Generative Adversarial Networks* (FCUP, External Examiner)
- 2021** Vítor Figueiredo: *Feasibility of using autoencoders for learning car interior background models* (U. Minho, External Examiner)



## M.Sc. SUPERVISIONS

- on-going** Rafael Cristino: *Introducing Domain Knowledge to Autonomous Driving* (FEUP)
- on-going** Alankrita Asthana: *Iterative Inference for Point-Clouds* (TUM, Munich)

- on-going** José Guerra (with L. Teixeira): *Academic Internship in Out of Distribution Detection – Autonomous Driving* (Internship at Bosch Car Multimedia) (FEUP)
- 2022** Pedro Silva (with T. Gonçalves): *Human Feedback during Neural Networks Training* (FEUP) [↗](#)
- 2022** João Silva: *Environment Detection for Railway Applications based on Automotive Technology* (Internship at Continental) (FEUP) [↗](#)
- 2022** Ana Bezerra (with J. Costa): *Phishing Detection with a Machine Learning Net* (Internship at E-goi) (FCUP) [↗](#)

## 👤 B.Sc. PROJECTS SUPERVISIONS ---

- 2022** Diana Silva (with T. Gonçalves): *Semantic Segmentation in Neural Networks using Iterative Visual Attention*
- 2022** Filipe Campos, Francisco Cerqueira, Vasco Alves: *Mobile App using Object Detection for Car Driving*
- 2022** Bruno Gomes, Rafael Camelo: Internship at ANO