



Ricardo Pereira de Magalhães Cruz

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- For the last five years, I have been working as a machine learning researcher at INESC TEC. I have just finished my Ph.D. thesis which I will defend very soon. Meanwhile, I have also been working at FEUP as a teacher assistant (TA): teaching Python and C++.
- As a machine learning researcher, I have worked mostly on deep learning applied to computer vision, using both TensorFlow and PyTorch. In the past, I have participated in many open-source projects and also did much consulting work: on web development (flask), databases (mongo, postgres), multimedia (sdl, gtk, qt), server administration (hpc) and others.
- In terms of education, I am about to finish my Ph.D. in computer science. I have a masters in applied mathematics and a bachelors in computer science.

[-] Education

- (2021) **PhD in Computer Science (currently waiting for defense!)**
co-joint University of Porto, Minho and Aveiro
- 2015 **MSc in Applied Mathematics (grade=18/20)**
Faculty of Sciences, University of Porto
- 2012 **BSc in Computer Science (grade=16/20)**
Faculty of Sciences, University of Porto

[-] Career

- 2018–2021 **Teacher Assistant (Python and C/C++)**
Faculty of Engineering, University of Porto
- 2016–2020 **PhD Grant (deep learning and computer vision)**
INESC TEC
- 2015 **Research Grant (machine learning)**
INESC TEC
- 2014 **Research Grant (epidemiology modelling)**
Mathematics Center of the University of Porto
- 2007 **Google Grant: Summer of Code (dynamic layouts)**
OpenOffice.org
- 2006 **Google Grant: Summer of Code (YaST GTK port)**
Novell / openSUSE

I have also done much freelance work through the years; with emphasis on travel destinations search algorithms (Flykt) and I do regular consulting work for a geography team. See my github for my open-source projects: <https://github.com/rpmcruz>.

[-] Awards

- 2020 **Best Oral Presentation at RECPAD 2020**
"Training Convolutional Neural Networks to be Background Invariant"
- 2021 **Pedagogical Recognition Award**
Faculty of Engineering, University of Porto
- 2021 **Sustainable Ideas**
Faculty of Engineering, University of Porto

[-] Publications

- 2021 **Ordinal Losses for Classification of Cervical Cancer Risk [accepted]**
T. Albuquerque, R. Cruz, J. Cardoso
PeerJ Computer Science
- 2021 **Background Invariance by Adversarial Learning [accepted]**
R. Cruz, R. Prates, E. Filho, J. Costa, J. Cardoso
25th International Conference on Pattern Recognition (ICPR), IEEE
- 2019 **Automatic Augmentation by Hill Climbing**
R. Cruz, J. Costa, J. Cardoso
28th International Conference on Artificial Neural Networks (ICANN), Springer
- 2019 **Averse Deep Semantic Segmentation**
R. Cruz, J. Costa, J. Cardoso
41st Engineering in Medicine and Biology Conference (EMBC), IEEE
- 2019 **Insulator visual non-conformity detection in overhead power distribution lines using deep learning**
R. Prates, R. Cruz, A. Marotta, R. Ramos, E. Filho, J. Cardoso
Journal Computers & Electrical Engineering, Springer
- 2018 **A Class Imbalance Ordinal Method for Alzheimer's Disease Classification**
R. Cruz, M. Silveira, J. Cardoso
2018 International Workshop on Pattern Recognition in Neuroimaging (PRNI), IEEE
- 2018 **Binary ranking for ordinal class imbalance**
R. Cruz, K. Fernandes, J. Costa, M. Pérez Ortiz, J. Cardoso
Journal Pattern Analysis and Applications, Springer
- 2018 **Deep image segmentation by quality inference**
K. Fernandes, R. Cruz, J. Cardoso
International Joint Conference on Neural Networks (IJCNN), IEEE
- 2017 **Constraining type II error: building intentionally biased classifiers**
R. Cruz, K. Fernandes, J. Costa, J. Cardoso
International Work-conference on Artificial Neural Networks (IWANN), Springer
- 2017 **Fine-to-coarse ranking in ordinal and imbalanced domains: an application to liver transplantation**
M. Pérez-Ortiz, K. Fernandes, R. Cruz, J. Cardoso
International Work-conference on Artificial Neural Networks (IWANN), Springer
- 2017 **Combining ranking with traditional methods for ordinal class imbalance**
R. Cruz, K. Fernandes, J. Costa, M. Pérez-Ortiz, J. Cardoso
International Work-conference on Artificial Neural Networks (IWANN), Springer
- 2017 **Ordinal class imbalance with ranking**
R. Cruz, K. Fernandes, J. Costa, M. Pérez-Ortiz, J. Cardoso
Iberian conference on pattern recognition and image analysis (Ibipria), Springer
- 2016 **Tackling class imbalance with ranking**
R. Cruz, K. Fernandes, J. Costa, J. Cardoso
International Joint Conference on Neural Networks (IJCNN), IEEE