



# Ricardo Cruz

- Machine learning specialist
- Computer vision specialist
- Programmer

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🏠 <http://rpmcruz.github.io>

For the last few years, I have been working at INESC TEC – an institute that does both academic research and industry development. I have been doing both machine learning and computer vision, working in TensorFlow, PyTorch, and OpenCV.

I have just completed my Ph.D. in Computer Science (june 2021). During the Ph.D., I have been serving a few hours per week as a Teacher Assistant at the Faculty of Engineering, University of Porto, helping teach Python and C++. In 2021, I was awarded the Pedagogy Award based on student feedback.

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

## WORK EXPERIENCE

### Oct. 2015–Jul. 2021 | INESC TEC

Machine Learning Specialist

- INESC TEC is an R&D institute whose headquarters are located in Porto. I collaborated in the following projects:
  - 2020–2021 **CadPath.AI**: high-performing computing platform in collaboration with IMP for molecular diagnosis of cancer cells
  - 2018–2020 **CLARE**: low-cost mobile device for cervical cancer diagnosis in collaboration with Fraunhofer
  - 2015–2017 **NanoSTIMA**: medical machine learning systems, in collaboration with CINTESIS, FMUP and IBMC
- Internal awards
  - 2021 march: outstanding recognition award  
<https://bip.inesctec.pt/en/especiaisdecorrida/ricardo-cruz-ctm-2/>
  - 2018 sept: outstanding recognition award  
<http://bip-archive.inesctec.pt/en/196/fora-de-serie.html>

### Sept. 2018–Feb. 2022 | FEUP

Teacher Assistant (part-time)

- Teaching Python (EIC0005) and C/C++ (EIC0012)
- 2021: received FEUP pedagogic award, voted by students

### 2014 (6 months) | Research Grant

Mathematics Center of the University of Porto

Research on epidemiological models: from differential equations to stochastic simulations and cellular automata.

## EDUCATION

### 2016–2021 | Ph.D. in Computer Science

University of Porto, Minho and Aveiro (joint degree)

- Thesis title: Re-thinking a Deep Learning Pipeline for Images
- Supervisors: Jaime S. Cardoso and Joaquim F. Pinto Costa
- 12 publications, 1 best paper award

### 2013–2015 | MSc in Mathematical Engineering

Faculty of Sciences, University of Porto

- Graduated with honors: 18 out of 20 points

### 2009–2012 | BSc in Computer Science

Faculty of Sciences, University of Porto

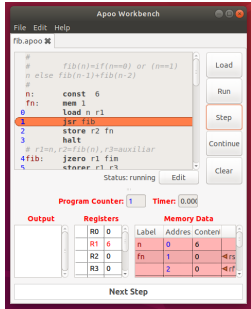
- Graduated with honors: 16 out of 20 points

## SELECTED OPEN-SOURCE PORTFOLIO

**2017** | Avito NLP competition @ Kaggle

Bronze award for results and silver award for engagement

**2010** | Apoo, a virtual machine



I helped with the development of Apoo (together with Profs Rogério Reis and Nelma Moreira), a virtual machine that is currently being used to teach Assembly. Apoo is written in Python and GTK+.

**2009** | EatFeed

RSS/Atom reader written in C++ and GTK+

<https://github.com/rpmcruz/eatfeed>



**2006 and 2007** | Google Summer of Code

- 2007: LibreOffice dynamic layouts (C++)
- 2006: YaST port from GTK+ to Qt (C++)

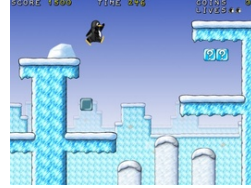
**2005** | J2ME and Android games

<https://github.com/rpmcruz/android-games>

Games written in Java Mobile Edition; more recently, I ported a couple of them to Android.

**2005** | SuperTux, co-author

<https://www.supertux.org/>



While in high-school, I was part of the initial team developing this game. It is written in C++, SDL, and OpenGL.

- Find more of my open-source code at <https://github.com/rpmcruz>.
- Videos showing some of my work: [https://www.youtube.com/channel/UCLS60CVgk\\_qPohhUqSPvLJw](https://www.youtube.com/channel/UCLS60CVgk_qPohhUqSPvLJw).

## PUBLICATIONS

1. **2021:** Ordinal Losses for Classification of Cervical Cancer Risk  
T. Albuquerque, R. Cruz, J. Cardoso. PeerJ Computer Science [IF: 3.09]
2. **2021:** Background Invariance by Adversarial Learning  
R. Cruz, R. Prates, E. Filho, J. Costa, J. Cardoso. 25th International Conference on Pattern Recognition (ICPR), IEEE [CAPES: A2]
3. **2019:** Automatic Augmentation by Hill Climbing  
R. Cruz, J. Costa, J. Cardoso. 28th International Conference on Artificial Neural Networks (ICANN), Springer [CAPES: B1]
4. **2019:** Averse Deep Semantic Segmentation  
R. Cruz, J. Costa, J. Cardoso. 41st Engineering in Medicine and Biology Conference (EMBC), IEEE [CAPES: A2]
5. **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 [IF: 2.66]
6. **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
7. **2018:** Binary ranking for ordinal class imbalance  
R. Cruz, K. Fernandes, J. Costa, M. Pérez Ortiz, J. Cardoso. Journal Pattern Analysis and Applications, Springer [IF: 1.51]
8. **2018:** Deep image segmentation by quality inference  
K. Fernandes, R. Cruz, J. Cardoso. International Joint Conference on Neural Networks (IJCNN), IEEE [CAPES: A2]
9. **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 [CAPES: B1]
10. **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 [CAPES: B1]
11. **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 [CAPES: B1]
12. **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 (Ibpria), Springer [CAPES: B2]
13. **2016:** Tackling class imbalance with ranking  
R. Cruz, K. Fernandes, J. Costa, J. Cardoso. International Joint Conference on Neural Networks (IJCNN), IEEE [CAPES: A2]