André Pacheco | Curriculum Vitae

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Education

- **Federal University of Espírito Santo** **Vitória, Brazil**
  Ph.D., Computer Science, Supervisor: Prof. Dr. Renato A. Krohling *Aug 2016 – Aug 2020*
  Research project title: Deep learning applied to skin cancer detection using images collected from smartphones and patient demographics

- **Federal University of Espírito Santo** **Vitória, Brazil**
  Ms.C., Computer Science, Supervisor: Prof. Dr. Renato A. Krohling *Sep 2014 - Jul 2016*
  Ms.C. thesis: Aggregation of neural classifiers via Choquet integral with respect to a fuzzy measure

- **Federal University of Espírito Santo** **Vitória, Brazil**
  B.S., Computer Engineering *Mar 2009 – Aug2014*
  Undergraduate Program in Computer Science and Electrical Engineering
  B.S. Thesis: Designing a fuzzy controller using differential evolution applied to a line follower robot

Main publications

- Krohling, R.A., **Pacheco, A.G.C.** and Siviero, A.L., 2013. IF-TODIM: An intuitionistic fuzzy TODIM to multi-criteria decision making. Knowledge-Based Systems, 53, pp.142-146.
- Krohling, R.A. and **Pacheco, A.G.C.**, 2015. A-TOPSIS–an approach based on TOPSIS for ranking evolutionary algorithms. Procedia Computer Science, 55, pp.308-317.
- Hrasko, R., **Pacheco, A.G.C.** and Krohling, R.A., 2015. Time series prediction using restricted boltzmann machines and backpropagation. Procedia Computer Science, 55, pp.990-999.
- **Pacheco, A.G.C.**, Krohling, R.A. and da Silva, C.A., 2018. Restricted Boltzmann machine to determine the input weights for extreme learning machines. Expert Systems with Applications, 96, pp.77-85.
- **Pacheco, A.G.C.** and Krohling, R.A., 2018. An approach to improve online sequential extreme learning machines using restricted Boltzmann machines. On International Joint Conference on Neural Networks (IJCNN) (pp. 1-8). IEEE.
- **Pacheco, A.G.C** and Krohling, R.A., 2018. Aggregation of neural classifiers using Choquet integral with respect to a fuzzy measure. Neurocomputing, 292, pp.151-164.
- De Angelo, G.G., **Pacheco, A.G.C.** and Krohling, R.A., 2019. Skin lesion segmentation using deep learning for images acquired from smartphones. On International Joint Conference on Neural Networks (IJCNN) (pp. 1-8). IEEE.

- **Pacheco, A.G.C.**, Ali, A.R., Trappenberg, T., 2019. Krohling, R.A., 2019. Skin cancer detection based on deep learning and entropy to detect outlier samples. On International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) @ Skin Imaging Collaboration challenging workshop.
- **Pacheco, A.G.C.** and Krohling, R.A., 2019. The impact of patient clinical information on automated skin cancer detection. Computers in biology and medicine.
- **Pacheco, A.G.C.** and Krohling, R.A., 2019. Recent advances in deep learning applied to skin cancer detection. On Neural Information Processing Systems @ Retrospectives workshop.

Awards, Honors and scholarships

- **2010**: 1st place (out of 31 teams) in the Latin America Robotics Competition (LARC), category IEEE-SEK, São Paulo, Brazil.
- **2011**: 1st place (out of 22 teams) in the Latin America Robotics Competition (LARC), category IEEE-SEK, Bogotá, Colombia.
- **2012**: The State of Espírito Santo Research Agency (FAPES) scholarship for undergraduate research (R$ 4,800/year).
- **2013**: 2nd place (out of 19 teams) in the Latin America Robotics Competition (LARC), category IEEE-OPEN, Arequipa, Peru.
- **2013**: The best undergraduate research work in engineering and exact sciences at the Federal University of Espírito Santo (out of 151 projects).
- **2014**: Full scholarship from Brazil's research agency CAPES (R$ 18,000/year) for a two-years master's degree program at the Federal University of Espírito Santo.
- **2016**: Full scholarship from Brazil's research agency CAPES (R$ 26,400/year) for a four-years PhD program at the Federal University of Espírito Santo.
- **2018**: The State of Espírito Santo Research Agency (FAPES) grant (R$ 132.100,00) for the Ph.D. project "Skin cancer detection based on images collected from smartphones and patient demographics".
- **2019**: 4th place (out of 64 teams) in the International Skin Imaging Collaboration challenge - ISIC 2019 task 1.
- **2019**: 3rd place (out of 16 teams) in the International Skin Imaging Collaboration challenge - ISIC 2019 task 2.
- **2019**: Travel awards NeurIPS 2019

Research Experience

- **Hierarchical Anticipatory Learning Lab. (HALLab), Dalhousie University** **Halifax, Canada**
  Visiting Graduate Research Student with Prof. Dr. Thomas Trappenberg *Jun 2019 – Mar 2020*

  Worked with Prof. Dr. Thomas Trappenberg on dynamic weights for an ensemble of deep models and out-of-distribution detection applied to medical data.

- **Bio-inspired Laboratory (LABCIN), Federal University of Espírito Santo** **Vitória, Brasil**
  Ph.D. student with Prof. Dr. Renato A. Krohling *Aug 2016 – Aug 2020*
  Worked with Prof. Dr. Renato A. Krohling and Profa. Dra. Patricia Lyra Frasson on deep learning applied to skin cancer detection and interpretability/explainability.

- **Bio-inspired Laboratory (LABCIN), Federal University of Espírito Santo** **Vitória, Brasil**
  Ms.C. student with Prof. Dr. Renato A. Krohling *Sep 2014 – Jul 2016*
  Worked with Prof. Dr. Renato A. Krohling on aggregation algorithms applied to an ensemble of classifiers

- **Robotic Laboratory, Federal University of Espírito Santo** **Vitória, Brasil**
  Undergraduate research student with Profa. Dra. Roberta L. Gomes *Jun 2012 – Feb 2014*
  Worked with a team of students led by Profa. Dra. Roberta L. Gomes to develop algorithms and hardware to educational robots.

Professional Experience

- **Sharespot Inc** **Vitória, Brazil**
  Software developer *Jan 2016 - Dez 2016*
  - Sharespot is a marketing company that applies technological tools to develop interactive solutions to its clients.
  - Worked with a team that developed marketing solutions for web systems using Java and Angular.

- **Padtec S/A** **Vitória, Brazil**
  Software Developer - Intern *Feb 2013 - Jan 2014*
  - Padtec is a global supplier focused on the development, manufacture, and marketing of turnkey solutions for optical systems.
  - Worked with a team that designed a software simulator to optical transport network (OTN) in C++.

- **Núcleo de Cidadania Digital - NCD** **Vitória, Brazil**
  IT help desk - Intern *Feb 2011 - Mar 2012*
  - The NCD is a program of the Federal University of Espírito Santo that offers free services and facilities to promote and teach technological tools.
  - Worked with a team that provided IT help desk to computers based on Linux distributions.

Academic activity and service

- **Teaching assistant:**

  2018: INF-00714 - Software Development in C. Instructor: Jordana Salamon
  2017: EPR-12992 - Computational Simulation. Instructor: Renato A. Krohling
  2015: INF-00714 - Software Development in C. Instructor: Maria C. S. Boeres

- **University Activities:**

  2017 - Present: **Dermatological Assistance Program (PAD-UFES)** - In addition to being part of my doctoral research project, I also work as a volunteer software engineer for this program. I lead a team that has developed and maintain a web server (Java/SpringBoot and Angular) and a smartphone application (React-Native) to collect and store patient data.

  2018: **Kangaroo Project (UFES)** - This is a project that provides assistant to pregnant teenagers in the Espírito Santo state. This is a major health issue in Brazil and I worked as a volunteer data an-

alyst to help researchers from this project understand the data that they collect from their patients.

2012-2014: **UFES' robotic team (ERUS):** I am a co-founder of the UFES' robotic team (ERUS). This team has participated in and won several types of robotic competitions. In 2013, I was chosen as the team leader, which was a unique experience that I had during my undergraduate.

2012: **Solidarity Teaching Project (PAS-UFES)** - This was a free preparatory course to help low-income people to get a spot in a public university in Brazil. I worked as a volunteer physics teacher (high school level) in this project.

- **B.S. Thesis co-advisor**:

  2016: Designing algorithms using Restricted Boltzmann Machine applied to time series forecasting. Author: José M. N. Cardoso Neto.
  2017: Discriminative Restricted Boltzmann Machine and PSO applied to data classification. Author: Guilherme Artém dos Santos.
  2017: Skin cancer classification using CNNs embedded in smartphones. Author: Gabriel S. C. Ucelli.
  2018: Skin cancer segmentation using images collected from standard camera. Author: Gabriel Giorisatto De Angelo.
  2019: Development of a tool for data analysis and visualization of the UFES Dermatological Assistance Program. Author: Felipe Branquinho Rodrigues.

Invited talks

- **Institutional talks:**

  2019: Introduction to machine learning. Faculdade Multivix, Vitória, Brazil.
  2018: Introduction to Python for scientific computer. Production Engineer, UFES, Vitória, Brazil.
  2016: Introduction to data classification. Jornada de Atualização em Computação, Elétrica e Eletrônica - JAACE, UFES Vitória, Brazil.

- **Conference Orals:**

  2019: Recent advances in deep learning applied to skin cancer detection. NeurIPS 2019 @ Retrospectives workshop - Vancouver, Canada.
  2018: An approach to improve online sequential extreme learning machines using restricted Boltzmann machines. IJCNN 2018 - Rio de Janeiro, Brazil.
  2016: Discriminative Restricted Boltzmann Machine applied to data classification. SBPO 2016 - Vitória, Brazil.

Technical and Personal skills

- **Natural Languages:** native Portuguese, advanced English and basic Spanish.
- **Programming Languages:** Python, Tensorflow, PyTorch, Java, Spring Boot, Angular, React-Native, Javascript, MATLAB, HTML, CSS, and Latex.
- **Softwares**: Adobe Fireworks, WordPress, Jekyll, and OpenScad
- **Hardwares:** Arduino and Raspberry-Pi

Additional activities

- I have a blog called `http://computacaointeligente.com.br` in which I teach Artificial Intelligence/Machine Learning to Portuguese speakers. In Brazil, most people do not or have low proficiency in English, which limits them to learn concepts in this field. My goal is to fill this gap and help them to have access to this knowledge.
- I like to watch e-sport games, in particular, League of Legends. In order to get more insights about the game, I like to crawl data and perform some analysis of them. You can find these analyses on my blog.
- As you can see in my activities, I am very engaged in social projects. I always focus on using my knowledge for good causes. Currently, my main goal is to help clinicians to improve the skin cancer assessment for low-income people in Brazil.

References

- Available upon request.