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Paulo Henrique Barchi

Ph.D. in Applied Computing

Machine Learning Specialist

Work Experience

- 10/2019–present **Machine Learning Engineer**, ACCENTURE. Belo Horizonte, MG - Brazil.
Working in a Research, Development and Innovation (RD&I) project focused on Deep Learning-based Computer Vision and Video Analytics. Overcoming challenges related to object detection, pose estimation, tracking, activity recognition. Contributions on developing the solution as a whole: initial exploratory data analysis and preprocessing (cleaning, labeling, and data augmentation); designing and training machine learning models; analysing results through different performance metrics; developing and supporting libraries and modules required by the software architecture. As the most senior developer, I have been the main point of contact with the client in the technical aspect, performing activities such as: plan and present updates and deliveries; answer questions and discussions from the client, either to simplify some concept and improve understanding, or to get into more technical details. I have been leading paper submissions to peer-reviewed events. Currently, I have also been responsible for initializing and shutting down infrastructure machines of the development environment.
- 10/2018–09/2019 **Ph.D. Research Fellow**, BRANDEIS UNIVERSITY. Waltham, MA - EUA.
Development, consulting, support and documentation in scientific computing applications. I had lead the project for morphological classification of 670.560 galaxies using machine learning — a collaboration of national and international research groups, with impactful publications and conference talks.
- 04/2016–08/2016 **Information Technology Analyst**, SABER EDUCATIONAL AND SOCIAL TECHNOLOGIES. Recife, PE - Brazil.
Support, documentation and minor developments on company's systems (NodeJS, Java2EE).
- 11/2014–05/2015 **Information Technology Analyst**, PST - POSITRON. Campinas, SP - Brazil.
Support and minor developments on most of the company's systems (Java2EE, MySQL).
- 01/2011–03/2012 **Information Technology Analyst**, SST IT SOLUTIONS. Campinas, SP - Brazil.
Development of a Warehouse Management System to one of the biggest notebook assemblers of the continent (Java2EE). Support and minor developments in other systems of the company.
- 07/2010–12/2010 **Information Technology Intern**, ZARPSYSTEM. São Carlos, SP - Brazil.
Support, development, test and requirements analysis in some of the company's systems (.NET platform). The main project was a supermarket inventory management system.

Education

- 09/2016–03/2020 **Ph.D. in Applied Computing**, *National Institute for Space Research (INPE)*.
São José dos Campos, SP - Brazil.
Topic: Machine and Deep Learning Applied to Galaxy Morphology.
- 03/2012–03/2015 **Master's degree in Computer Science**, *Federal University of São Carlos (UFSCar)*.
São Carlos, São Paulo - Brazil.
Topic: Never-Ending Ontology Extension Through Machine Reading
- 03/2007–12/2010 **Bachelor's degree of Computer Science**, *Federal University of São Carlos (UFSCar)*.
Sao Carlos, Sao Paulo - Brazil.
Topic: Alignment of ConceptNets for Machine Translation

Computer skills

General Applications, Programming Languages and Research Tools. Highlight for: PYTHON (PANDAS, SCIKIT-LEARN, KERAS, TENSORFLOW, PYTORCH, OPENCV), Linux, GIT, L^AT_EX, AWS, APACHE PULSAR, ANGULAR, SQL, C/C++, CYTHON, MPI/OpenMP

Main Publications

- Refereed Journal Articles **P. H. Barchi**, R. R. de Carvalho, R. R. Rosa, R. Sautter, M. Soares-Santos, B. A. D. Marques, E. Clua. *Machine and Deep Learning Applied to Galaxy Morphology - A Complete Classification Catalog*. Astronomy and Computing, 2020, v. 30, 100334. DOI: 10.1016/j.ascom.2019.100334.
- R. R. Rosa, R. R. de Carvalho, R. Sautter, **P. H. Barchi**, D. H. Stalder, T. C. Moura, S. B. Rembold, D. R. F. Morell, N. C. Ferreira. *Gradient Pattern Analysis Applied to Galaxy Morphology*. MNRASL, 2018, v. 477, n. 1, p. L101-105, DOI: 10.1093/mnrasl/sly054.
- P. H. Barchi**, E. R. Hruscka Jr. *Two different approaches to Ontology Extension Through Machine Reading*. JNIC, 2015, v. 03, p. 078-087.
- Conference Proceedings **P. H. Barchi**, F. G. da Costa, R. Sautter, T. C. Moura, D. H. Stalder, R. R. Rosa, R. R. de Carvalho. *Improving Galaxy Morphology with Machine Learning*. Bulletin of the Brazilian Astronomical Society. 2018, v. 30, n. 1, p. 180-181. ISSN: 0101-3440.
- P. H. Barchi**, E. R. Hruscka Jr. *Never-Ending Ontology Extension Through Machine Reading*. ICHIS, 2014, page 266. DOI: 10.1109/HIS.2014.7086210.

Main Conference Talks

- 03/2020 **Applied Computing Seminar**, NATIONAL INSTITUTE FOR SPACE RESEARCH (INPE). São José dos Campos - SP, Brazil.
Title: *Machine Learning Applications: From Astrophysics to Industry Videos*.
- 03/2019 **New England SACNAS Regional Meeting**, BRANDEIS UNIVERSITY. Waltham - MA, USA.
Title: *Applying Machine Learning to Galaxy Morphology*.
- 03/2019 **Conference of Computational Interdisciplinary Science (CCIS)**, GEORGIA TECH. Atlanta - GA, USA.
Title: *Applying Deep Learning to Galaxy Morphology*.
- 12/2014 **14th International Conference on Hybrid Intelligent Systems (HIS)**, GULF UNIVERSITY FOR SCIENCE AND TECHNOLOGY. Kuwait City, Kuwait.
Title: *Never-ending Ontology Extension Through Machine Reading*.

Awards and Fellowships

- 07/2019–08/2019 **Student Fellow – Kavli Summer Program in Astrophysics: Machine Learning in the era of large astronomical surveys**, UC Santa Cruz, Santa Cruz, CA - USA.
- 10/2018–09/2019 **CAPES International PhD Fellowship**, Brandeis University, Waltham, MA - USA.
- 09/2016–09/2018 **CAPES PhD Fellowship**, INPE, São José dos Campos, SP - Brazil.
- 08/2012–07/2014 **CNPq Master Fellowship**, UFSCar, São Carlos, SP - Brazil.
- 07/2009–06/2010 **Institutional Scientific Initiation Scholarship Program (PIBIC/CNPq)**, UFSCar, São Carlos, SP - Brazil.