Douglas David Baptista de Souza

Introduction

About, *Dr. Baptista de Souza is a PhD Engineer with R&D experience in Machine Learning and Signal Processing. Having participated in and led many R&D projects in the academia and the industry, Dr. Baptista de Souza is author and reviewer of papers in world-class conferences and journals (IEEE, Elsevier), and international consultant in Machine Learning for several companies. Currently, Dr. Baptista de Souza is a Senior Machine Learning Scientist at Dynamox, Brazil.*

Professional experience - Industry

2020 **Senior Machine Learning Scientist**, *Dynamox*, Brazil.

2018–2020 **Lead Machine Learning Engineer**, *GE Renewable Energy*, Brazil.
Responsible for developing machine learning solutions (e.g. anomaly detectors, fault forecasters) and statistical analyses (e.g., component life models) for wind turbines and the digital services team.

2015–2017 **Researcher**, *GE Global Research Center*, Brazil, Worked on machine learning and signal processing R&D, such as tracking filters for system identification and predictive/diagnostic models.

- Led a project to create a fault forecasting model for wind turbines belonging to the GE fleet in LATAM.
- Worked on the development of a digital twin for one of the most advanced GE wind turbines, in a global collaboration with different teams of researchers, engineers and developers.
- Developed scripts to classify aircraft final approaches, implementing the developed analytic on a platform with 60 TB of flight data, used by major airline companies around the world.
- Worked on the development a digital twin for a GE jet engine, one of the first to be developed in LATAM.
- Used machine learning models to predict post-flight customer satisfaction for a major airline company, yielding important insights on customer profile and flight experience.
- Developed an AI model for automatic detection of anomalous lubrication conditions in gas turbines, which allowed more assertive and faster interventions by remote monitoring teams.

Professional experience - Academia

2015–2015 **Assistant Professor of Physics**, *Federal University of Santa Catarina*, Florianópolis, Brazil.

- Waves and propagation processes, classical mechanics.

2015–2015 **Professor of Electrical Engineering**, *SATC University*, Criciúma, Brazil.

- Electromagnetic waves and design of antennas.

International Consultant

Professional

2019 **AI/NLP specialist**, *Company: Swae*, Canada.

- Supported the development of an interactive NLP pipeline with diverse functions.

2018-2019 **Machine Learning & Speech Signal Processing Specialist**, *Company: Oyalabs*, Hong Kong.

- Developed a framework for automatic detection of silent/speech segments in audio files.

2018 **Machine Learning & Signal Processing Specialist**, *Company: Inspirit IOT*, United States.

- Studied and worked on the development of techniques to identify and process rare events in audio signals.

2014 **Machine Learning Specialist**, *Chaordic company*, Florianopolis - Brazil.

- Carried out a study to find structural patterns and change points in online purchase and click time serise.

Post-doctoral fellowships

2013–2014 **LTHE lab**, *Post-doctoral fellow*, Université Joseph Fourier, Grenoble, France.
Research topic: Developed a Matlab toolbox for smart selection of signals simulated from a particular run of a Global Climate Model (GCM), considering many aspects like emission scenarios and downscale rules. The framework was a multi-stage cluster selection method developed during the post-doctoral assignment.

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Education

2010–2013 **PhD in Electrical Engineering (Signal Processing)**, *Institut National Polytechnique de Grenoble, GIPSA-Lab*, Grenoble, France.

- Thesis: On nonparametric techniques for analyzing nonstationary signals. Advisor: Jocelyn Chanussot
- Research area: Statistical Signal Processing, Machine Learning, Real-world Signal Analysis.

2005–2009 **Electrical Engineering degree**, *Federal University of Santa Catarina*, Brazil.

Certifications

2016 **Six Sigma Green Belt (DFSS and Lean)**, *General Electric (GE).*

Awards

2010 **Erasmus Mundus**, *Erasmus Mundus full PhD scolarship in Grenoble, France.*

Languages

Fluent **Portuguese (Native language), English, and French**

Computer skills

Languages: Python, MATLAB, R

Other skills/packages: Tensorflow, Keras, LaTeX

Publications (all as first author)

Journal paper **IEEE Signal Processing Letters**, *An improved stationarity test based on surrogates*, D. B. de Souza, J. Chanussot, A.-C. Favre, and P. Borgnat, vol. 26, no. 10, p.1431-1435, 2019.

Journal paper **IEEE Signal Processing Letters**, *A time-varying autoregressive model for characterizing nonstationary processes*, D. B. de Souza, E. V. Kuhn, and R. Seara, vol. 26, no. 1, p.134-138, 2019.

Journal paper **Elsevier Signal Processing**, *A nonparametric test for slowly-varying nonstationarities*, D. B. de Souza, J. Chanussot, A.-C. Favre, and P. Borgnat, vol. 143, February 2018, p.241-252.

Conference paper **IEEE ICASSP 2014**, *A new nonparametric method for testing stationarity based on trend analysis in the time marginal distribution*, D. B. de Souza, J. Chanussot, A.-C. Favre, and P. Borgnat. In: 2014 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), p.320, Florence, Italy.

Conference paper **IEEE ICASSP 2014**, *On selecting relevant intrinsic mode functions in empirical mode decomposition: An energy-based approach*, D. B. de Souza et al. In: 2014 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), p.325, Florence, Italy.

Conference paper **IEEE LASCAS 2014**, *On generating a finite pulse or a symmetric impulse response by a generalized approximation function*, D. B. de Souza, and S. Noceti Filho. In: 2014 IEEE 5th Latin American Symposium on Circuits and Systems (LASCAS), p.1, Santiago, Chile.

Conference paper **IEEE ICASSP 2012**, *A modified time-frequency method for testing wide-sense stationarity*, D. B. de Souza, J. Chanussot, A.-C. Favre, and P. Borgnat. In: 2012 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), p.3409, Kyoto, Japan.

Conference paper **IEEE ISCAS 2011**, *An optimum linear phase approximation with small delay obtained by the manipulation of all-pass Padé approximants*, D. B. de Souza and S. Noceti Filho. In: 2011 IEEE International Symposium on Circuits and Systems (ISCAS), p.2265, Rio de Janeiro, Brazil.

Conference paper **SBRT 2009**, *Forma Simplificada de Determinacao das Funcoes de Atraso Filanovsky-Matkhanov e Propostas de Modificacoes*, D. B. de Souza and S. Noceti Filho. In: XXVII Simposio Brasileiro de Telecomunicacoes (SBRT), p.1-6, Blumenau, Brazil.

Patents

2018 **General Electric Co**, *System and method for detecting lubricated bearing condition*, Subrat Nanda, Douglas David Baptista de Souza, Bruno Paes Leao, 2019.
https://patents.google.com/patent/US20180334917A1/en

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