

Silvio Cabral Patricio

Contact

Belo Horizonte/MG
Brazil

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email

Languages

Portuguese | Understand well, speak well, write well and read well

English | Understands well, speaks reasonably, writes reasonably and reads well

French | Understands little, speaks reasonably, writes little and reads reasonably

Interests

Data science
Deep learning
Demography
High dimensional data
Image processing
Machine Learning
Mortality Modeling
Probability
Statistical Inference
Statistical Learning

Networks

Github
Google Scholar
Kaggle
LinkedIn

Education

- 2012 - 2017 **Bachelor's degree in Statistics** Espíto Santo, Brazil
Federal University of Espírito Santo
Title: Segregated regression for auto correlated data
Advisor: Fabio A. F. Molinares
Co Advisor: Alessandro J. Q. Sarnaglia
- 2018 - 2020 **Master's degree in Statistics** Minas Gerais, Brazil
Federal University of Minas Gerais
Title: Statistical Properties of the Mortality Modeling
Advisor: Fredy W. Castellares Cáceres
Co Advisor: Bernardo Lanza Queiroz
- 2019 - 2019 **Short Course in Digital and Computational Demography** Rostock, Germany
International Max Planck Research School for Population, Health and Data Science
Winter course - 2-13 December 2019 in Rostock, Germany
- 2020 - 2020 **Short Course in Data Visualization** Rostock, Germany
International Max Planck Research School for Population, Health and Data Science
Short course - 13-17 July 2020 in Rostock, Germany
- 2020 - 2021 **Master's degree in Demography** Barcelona, Spain
Autonomous University of Barcelona
European Doctoral School of Demography

Skills and Competencies

Statistics

multivariate analysis, analysis of discrete and counting data, inference in graphs

Statistical modeling

mixture models, social network modeling, generalized linear models, regression analysis, regression methods for classification, discriminant analysis

Machine learning

KNN, k-means and hierarchical clustering, high-dimensional regression (shrinkage methods), decision trees, bagging, random forest, boosting, dimensionality reduction (PCA and factorial analysis)

Learning based on neural networks

Convolutional Networks, Recurrent Neural Networks, Recursive Neural Networks, Long Short-Term Memory, Autoencoders (dimensionality reduction)

Optimization

genetic algorithm and linear programming

Programming

solid knowledge in programming, and languages R (7 years of experience) and Python (Pandas, NumPy, Scikit-Learn, TensorFlow and Keras)

Others

Market research, statistical quality control, operational research

Experience

- 2018 - Now **Rn00bs** Minas Gerais, Brasil
Founder and tutor
The rn00bs is a community created in 2018 by three post-graduate students in Statistics from the Federal University of Minas Gerais, to disseminate and teach applied and theoretical statistics, machine learning and data science to people unfamiliar with the programming language R

2019 - 2019	Tenbu (company specializing in decision support solutions) <i>Resident Data scientist</i>	Minas Gerais, Brazil
	<ul style="list-style-type: none"> • Industrial process modeling using machine learning • Missing data imputation using statistical learning • Prediction of metallurgical process failure • Business model to data science problems • Time series modeling for fault detection • Handling large 	
2017 - 2018	CONSTAT - Consultoria Estatística (statistical consulting) <i>Founder and project director</i>	Espírito Santo, Brazil
	<ul style="list-style-type: none"> • Exploitation of statistical databases through the extraction of information through modeling techniques and non-parametric statistical inference, aiming at decision-making • Sample planning, questionnaire design and data analysis, aimed at market research to aid decision making • Training in programming logic and statistical methods in R and Excel • Creation and analysis of indices / indicators • Statistical modeling for pattern recognition • Preparation of reports, charts and tables 	
2017-2018	Pré-vestibular Dandara (social project for underprivileged youth) <i>Volunteer teacher</i> Math teacher in probability and statistics	Espírito Santo, Brazil
2012 - 2013	NUMES – Núcleo de Modelagem Estocástica (Stochastic Modeling lab) <i>Junior Research Fellow</i> Research in Estimation in replicate processes with application in time series Advisor: Valderio Anselmo Reisen (valderioanselmoreisen@gmail.com)	Espírito Santo, Brazil
2015 - 2015	LCAD – Laboratório de Computação de Alto Desempenho (High Performance Computing Lab) <i>Junior Research Fellow</i> Research in Diagnostic, formative and summative evaluation of programming learning Advisor: Marcia Gonçalves de Oliveira (clickmarcia@gmail.com)	Espírito Santo, Brazil
2014-2018	LECON – Laboratório de Estatística e Computação Natural (Laboratory Of Statistics And Natural Computing) <i>Junior Research Fellow</i> Title: Research in Statistical analysis of linear and non-linear time series Advisor: Fabio Alexander Fajardo Molinares (fabio.fajardo@gmail.com)	Espírito Santo, Brazil
2017 - 2018	UFES – Universidade Federal do Espírito Santo (Federal University of Espírito Santo) <i>Junior Research Fellow</i> Title: Research in Segregated regression for auto correlated data. Advisor: Alessandro José Queiroz Sarnaglia (alessandro.sarnaglia@gmail.com)	Espírito Santo, Brazil
	<i>Undergraduate teaching assistant</i> Title: Undergraduate teaching assistant in Statistical programming languages Advisor: Fabio Alexander Fajardo Molinares (fabio.fajardo@gmail.com)	
	<i>Undergraduate teaching assistant</i> Title: Undergraduate teaching assistant in Probability and statistics Advisor: Fabio Alexander Fajardo Molinares (fabio.fajardo@gmail.com)	

Awards

- 2018 **Data Battle - Health** Itaú - São Paulo, Brazil
Project: SALUS
70% of surgical procedures would not need to be performed. Salus proposes a decision-making aid system for managers of public hospitals regarding the prioritization and choice of breast cancer treatments ([verification link](#))

Personal projects in machine learning & data science

- 2019 **Music modeling using spectrogram and Convolutional Neural network** Project completed
I use the music spectrum to extract features from songs, so I use CNN to create a classifier for my favorite Spotify songs. The idea is to try other approaches to achieve better model accuracy and generalize to predict the Spotify's top 10.
- 2018 **Interpretable statistical methods for image segmentation** Project completed
Gaussian mix models are used for modeling the image histogram. From this, a hypothesis test was derived to define how many segments the image has.
- Breast Cancer Treatment Value Prediction Learning Machine** Project completed
In this project, I used radiographic images to segment the tumor and take features from the images. Hence, estimating whether the tumor is benign or malignant, the risk of treatment for the patient's life, and the cost of treatment. That way allowing the manager to better manage resources.

Scholarly Publications

- 2020 Theoretical Population Biology
CASTELLARES, F.; **PATRICIO, S. C.**; LEMONTE, A.; QUEIROZ, B. L. . On closed-form expressions to Gompertz–Makeham life expectancy. ([link](#))
- Statistics and Probability Letters
CASTELLARES, F.; **PATRICIO, S. C.**; LEMONTE, A. . On gamma-Gompertz life expectancy. ([link](#))
- 2019 Anais do IV Seminário Internacional de Estatística com R
PATRICIO, S. C. ; PANARO, R. V. ; LIMA, A. S. ; SILVA, P. V. . Change Point Estimation in Segmented Regression Model Using Rstan: An Application to Exercise Physiology Data. In: Anais do IV Seminário Internacional de Estatística com R, v. 4, ISSN: 2526-7299, 2019. ([link](#))
- Anais do IV Seminário Internacional de Estatística com R
PANARO, R. V. ; LIMA, A. S. ; **PATRICIO, S. C.** . Semiparametric Survival Analysis via Bernstein Polynomials. In: Anais do IV Seminário Internacional de Estatística com R, v. 4, ISSN: 2526-7299, 2019. ([link](#))
- Anais do IV Seminário Internacional de Estatística com R
LIMA, A. S. ; **PATRICIO, S. C.** ; SILVA, L. A. C. ; PANARO, R. V. . Classificador Ensemble: uma abordagem não-paramétrica aplicada à detecção de diabetes (Ensemble Classifier: A Nonparametric Approach Applied to Diabetes Detection). In: Anais do IV Seminário Internacional de Estatística com R, v. 4, ISSN: 2526-7299, 2019. ([link](#))
- 2018 Anais da Jornada de Iniciação Científica da UFES
PATRICIO, S. C. ; SARNAGLIA, A. J. Q. . Análise de regressão segmentada para dados autocorrelacionados com aplicação a determinação do platô do VO2 (Segmented regression analysis for autocorrelated data with VO2 plateau determination application). In: Anais da Jornada de Iniciação Científica, v. 9, ISSN: 2357-7746, 2018. ([link](#))
- 2012 Anais da Jornada de Iniciação Científica da UFES
PATRICIO, S. C. ; REISEN, V. A. . Estimação em processos replicados com aplicações em séries reais (Estimation in replicated processes with real series applications). In: Anais da Jornada de Iniciação Científica, v. 3, 2012, ISSN: 2357-7746. ([link](#))

Submitted papers

2020

IEEE Transactions on Biomedical Engineering

PATRICIO, S. C.; Queiroz, A. J; Molinares, F. F. . The plateau of oxygen uptake in exercise physiology: a segmented regression estimation for autocorrelated data.

International Statistical Review

CASTELLARES, F. ;**PATRICIO, S. C.**; LEMONTE, A.. On the Gompertz-Makeham law: A useful mortality model to deal with human mortality

Papers in progress

2020

PATRICIO, S. C.; CASTELLARES, F. ; QUEIROZ, B. L.; LEMONTE, A.. Modeling the mortality force in old age using the mixture models

PATRICIO, S. C.; PANARO, R. V. . The mortality plateau: a model for its estimation

Academic & Scientific Poster Presentation

2019

2nd Conference on Statistics and Data Science

PANARO, R. V. ; **PATRICIO, S. C.** . C. ; MAYRINK, V. ; COSTA, M. . Predictive modeling of economic and financial monitoring of the Brazilian electricity regulatory agency (ANEL). In: 2nd Conference on Statistics and Data Science (CSDS 2019), 2019, Salvador, BA. Conference on Statistics and Data Science, 2019.

ESTE - Escola de Séries Temporais e Econometria

PANARO, R. V. ; LIMA, A. S. ; **PATRICIO, S. C.** ; SILVA, P. V. . Modelagem e Previsão da Inflação Anual Efetiva medida pelo IPCA (Modeling and Forecasting Effective Annual Inflation Measured by IPCA). In: ESTE - Escola de Séries Temporais e Econometria, 2019, Gramado, RS. ESTE - Escola de Séries Temporais e Econometria, 2019.

2018

XIII Semana de Estatística: A Estatística na Sociedade e na era Big Data

PATRICIO, S. C. ; SARNAGLIA, A. J. Q. ; FAJARDO, F. A . Análise de Regressão Segmentada para Dados Autocorrelacionados com Aplicação à Determinação do Platô do VO₂ (Segmented regression analysis for autocorrelated data with VO₂ plateau determination application). In: XIII Semana de Estatística: A Estatística na Sociedade e na era Big Data, 2018, Vitória, ES. XIII Semana de Estatística: A Estatística na Sociedade e na era Big Data, 2018.

2016

XII Semana de Estatística

PATRICIO, S. C. . ; INABA, F. K. ; CORNEJO, M. L. ; FAJARDO, F. A . Regressão linear com regularização: Um estudo comparativo (Linear Regression with Regularization: A Comparative Study). In: XII Semana de Estatística, 2016, Vitória-ES. XII Semana de Estatística, 2016.

2014

XI Semana de Estatística

PATRICIO, S. C. ; FAJARDO, F. A . Sobre o uso do periodograma de segunda ordem em processos bilineares (On the use of the second order periodogram in bilinear processes). In: XI Semana de Estatística, 2014, Vitória. XI Semana de Estatística, 2014.

2012

SINAPE - Simpósio Nacional de Probabilidade e Estatística

PATRICIO, S. C. ; COTTA, H. ; REISEN, V. A. . Estimação do modelo ARFIMA através de métodos paramétricos e testes de raízes baseados em ranks (Estimation of the ARFIMA model through parametric methods and rank-based root tests). In: SINAPE, 2012, João Pessoa. Simpósio Nacional de Probabilidade e Estatística, 2012.

X Semana de Estatística

PATRICIO, S. C. ; PESCA, F. C. ; LOPES, R. B. ; BARBOSA, E. F. ; MEDEIRO, P. C. F. . A poluição da Orla da Curva da Jurema, pela percepção de seus usuários (The pollution of the Curve of Jurema, by the perception of its users.). In: X Semana de Estatística, 2012, Vitória, ES. X Semana de Estatística, 2012.

Academic references

- 1st ref **Fredy Castellares Cáceres** master's advisor
Adjunct Professor at the Department of Statistics at the Federal University of Minas Gerais (Brazil), since 2006
1st email adress: fwcc29 at gmail.com
2nd email adress: fredy at est.ufmg.br
- 2nd ref **Bernardo Lanza Queiroz** master's co-advisor
Associate Professor at the Department of Demography and a researcher at CEDEPLAR at the Federal University of Minas Gerais (Brazil), since 2006
1st email adress: blanza at gmail.com
2nd email adress: lanza at cedeplar.ufmg.br
- 3rd ref **Alessandro Queiroz Sarnaglia** undergraduate advisor
Adjunct Professor at the Department of Statistics at the Federal University of Espírito Santo (Brazil), since 2010
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