Matheus Schossler

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EDUCATION

Washington University in St. Louis **Aug. 2017 – Present**
PhD Physics Candidate (Dec. 2022) & MA Physics (Aug. 2019), GPA: 3.96 Saint Louis, MO, USA

- Conference on Neural Information Processing Systems (NeurIPS 2021); Duke Machine Learning Winter School: Computer Vision (MLWS-CV 2022), used PyTorch; APS March Meeting 2021, 2020 & 2019.
- *Extracurricular:* Machine Learning Club; Diversity, Equity and Inclusion Committee; Physics Department Mentor.

University of Sao Paulo **Feb. 2015 – Jul. 2017**
MSc Physics, GPA: A Sao Carlos, SP, Brazil

- Thesis: exact and numerical calculations of quantum spin correlations.[link]
- Award IFT-ICTP-SAIFR Young Physicist (South American competition), 4th place, IFT-UNESP, Sao Paulo.

University of Sao Paulo **Mar. 2011 – Dec. 2014**
BSc Physics, GPA: 8.3/10 Sao Carlos, SP, Brazil

- Prize Yvonne Mascarenhas for best talk, 2nd place, 2014 Undergraduate Physics Week.

EXPERIENCE

Centene Corporation **May 2022 – Aug 2022**
Machine Learning Engineer Graduate Intern St. Louis, MO, USA

- Investigated features to improve LightGBM model to classify admission messages.
- Automated a pipeline for hyperparameter tuning with Optuna, and model training with different features.
- Improved admission messages prediction overall accuracy up to 0.5% from 94.3% (deployed model).
- Improved behavioral health class sensitivity by 6% from 68%working with an imbalanced dataset.

Washington University in St. Louis **Aug. 2017 – Present**
PhD Researcher in Statistical, Quantum and Computational Physics; and Teaching Assistant Saint Louis, MO, USA

- Developed an exact algorithm to model various topological quantum states with a ∞-linked tensor network.[link]
- Constructed 4 new self-consistent numerical models in *Python* and successfully explained experimental data.
- Predicted energy levels and probability distributions of quantum states using *parallel computing* with 30x faster calculations.
- Conducted extensive data analysis of simulation and real data from experiments at the frontier of quantum physics knowledge.
- Designed graphics and schematic diagrams for data visualization using *matplotlib*, and *Mathematica*.
- Presented results at conferences to 100+ attendees.
- Teaching assistant for several courses: Statistical mechanics (graduate level); Electromagnetism II; Adv. mathematical physics I & II (graduate level); Introductory physics, etc.

University of Sao Paulo **Feb. 2015 – Jul. 2017**
MSc Researcher in Statistical, Quantum and Computational Physics; and Teaching Assistant Sao Carlos, SP, Brazil

- Developed and applied exact and numerical algorithms to calculate statistical correlations in large quantum systems.
- Implemented gradient descent to predict asymptotic behaviors of correlations.
- Tested various numerical models to predict correlations with highly oscillating kernels.

SKILLS

Modeling: statistics, stochastic calculus, data analysis, machine learning, deep learning, NumPy, pandas, PyTorch, TensorFlow, matplotlib, scikit-learn, SciPy, Mathematical modeling, parallel computing, time series
Programming languages (YOE): Python (5), C (1), Matlab (0.3), Bash (0.6), Fortran (1), Wolfram Mathematica (6)
Technologies/Frameworks: Linux, Git, SQL, MongoDB, Apache Kafka, Jupyter, PyCharm, Seaborn, LaTeX
Soft skills: Problem solving, research, detail-focused, self learning, teamwork, communication, teaching

ADDITIONAL PROJECTS

Machine Learning projects | PyTorch, TensorFlow, scikit-learn, SciPy, Pandas, Numpy **Feb. 2018 – Present**

- Predicted the most likely customers to churn based on their transaction activity history over a two years period by employing the K-means algorithm to cluster 15,000 businesses according to their attributes. [GitHub]
- Studied computer vision, natural language processing, and other ML and DL algorithms in small real-world projects using PyTorch, TensorFlow, scikit-learn, and SciPy.

Robinhood account activity data to Glacier Tax application [GitHub] |*Python*, *pandas* **March 2020**

- Created an app in python for cleaning and processing account activity data from Robinhood to be uploaded to Glacier Tax. The application finds and matches stocks that were sold in 2020 with stocks previously bought to calculate the profit and ultimately income taxes for stocks for nonresident aliens. It also exports the data in the format required to be uploaded into glaciertax.com. I recently started building an API using Flask and Python for better automation.

SELECTED PUBLICATIONS

- M. Schossler, et al. The inner workings of fractional quantum Hall parent Hamiltonians: An MPS point of view. 2021.[link]
- M. Schossler, M.S. thesis. University of Sao Paulo, 2017. Dynamics of two-spin operators in the XX model.[link]

VOLUNTEERING

BJC HealthCare, as **Data Manager**; St. Louis Inter-Faith Committee on Latin America (IFCLA) & Prof. Sebastiao de Oliveira Rocha, public state high school, as **English/Portuguese translator**.