

## EDUCATION

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**Washington University in St. Louis**

PhD Physics Candidate (Dec. 2022) & MA Physics (Aug. 2019), GPA: 3.96

**Aug. 2017 – Present**

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 São Paulo**

MSc Physics, GPA: A

**Feb. 2015 – Jul. 2017**

Sao Carlos, SP, Brazil

**University of São Paulo**

BSc Physics, GPA: 8.3/10

**Mar. 2011 – Dec. 2014**

Sao Carlos, SP, Brazil

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

## EXPERIENCE

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**Centene Corporation**

Machine Learning Engineer Graduate Intern

**May 2022 – Present**

St. Louis, MO, USA

- Researched features to improve LightGBM model for authorization classification.
- Automated Optuna hyperparameter tuning to improve model predictions with feature selection.
- Improved authorization prediction overall accuracy in 0.5%.
- Improved behavioral health class authorization accuracy prediction in 15%.
- Queried data from SQL and MongoDB servers and processed new train and test data sets.

**Washington University in St. Louis**

PhD Researcher in Statistical, Quantum and Computational Physics; and Teaching Assistant

**Aug. 2017 – Present**

Saint Louis, MO, USA

- Developed an exact algorithm to model various topological quantum states with a  $\infty$ -linked tensor network.[\[link\]](#)
- Constructed 4 new self-consistent numerical models in *Python* for statistical inference of 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 São Paulo**

MSc Researcher in Statistical, Quantum and Computational Physics; and Teaching Assistant

**Feb. 2015 – Jul. 2017**

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

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**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), SQL (0.2), Matlab (0.3), Bash (0.6), Fortran (1), Wolfram Mathematica (6)

**Technologies/Frameworks:** Linux, Git, Apache Kafka, Jupyter, PyCharm, Seaborn, LaTeX

**Soft skills:** Problem solving, research, detail-focused, self learning, teamwork, communication, teaching

## ADDITIONAL PROJECTS

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**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**

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- 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**

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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**.