

MATHEUS SCHLOSSER

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EDUCATION

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

São Carlos, SP, Brazil

University of São Paulo

BSc Physics, GPA: 8.3/10

Mar. 2011 – Dec. 2014

São Carlos, SP, Brazil

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

EXPERIENCE

Centene Corporation

Machine Learning Engineer Graduate Intern

May 2022 – Aug 2022

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 0.6% from 92% (deployed model).

- Improved behavioral health class sensitivity by 11% from 72% working with an imbalanced dataset.

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 ∞ -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

São 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 São 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**.