ANDERSON WAKI MISOBUCHI

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EXPERIENCE

Graduate Researcher - Weinberg Theory Group

University of Texas at Austin

📅 August 2016 – Present   ⦿ Austin, TX

- Research on the connection between quantum information and quantum gravity
- Experience with large scale numerical simulations on Texas Advanced Computing Center (TACC) supercomputer

Teaching Assistant / Instructor (TA/AI)

University of Texas at Austin

📅 August 2016 – Present   ⦿ Austin, TX

- Lab experiments, discussion sessions, office hours for various undergraduate physics courses including 1 year as instructor of record for Physical Science 304

TECHNICAL SKILLS

- **Languages:** Python, C, Matlab, SQL
- **Technologies:** Jupyter, Visual Studio, Git, Mathematica, LaTeX, Linux, Docker
- **Data Science:** Scikit-Learn, TensorFlow, Keras, Numpy, Scipy, Pandas, Matplotlib, Neural Networks

PERSONAL SKILLS

- Initiative to solve problems
- Logical thinking
- Verbal and written communication
- Comfortable working independently

ACHIEVEMENTS

- 6 articles published in top journals of the field
- 8+ talks and poster presentations in respected conferences
- Graduate Continuing Fellowship Award
  University of Texas at Austin - 2020
- ICTP-SAIFR Competition Young Physicists
  3rd place - 2013,   5th place - 2015

EDUCATION

PhD in Physics

University of Texas at Austin

📅 2016 - Expected May 2022

MS in Physics

University of São Paulo

📅 2016

BS in Physics

University of São Paulo

📅 2014

Selected Coursework:

- CS 378 - Geometric Foundations of Data Science
- SDS 380C - Statistical Methods I
- PHY 382N - Nonlinear Dynamics
- CS 395T - Quantum Complexity Theory

PROJECTS

Sparse SYK [Github] [Article]

- Simulated a sparse hypergraph based version of the SYK model, a many-body quantum system of great interest in theoretical physics.
- Implemented MPI paralellization and Krylov subspace techniques on TACC Stampede2 supercomputer.
- Achieved current largest scale simulation of the system with > 40 particles.
- Currently assigned as project co-PI to diagnose quantum chaotic properties in the sparse SYK model. Built prototypes and conducted benchmarks to scale up the simulation ready to run on 100+ computing nodes on TACC Frontera.

Tensor Networks [Github]

- Investigated applications of *tensor networks*, a framework to simulate quantum systems of many particles, to both supervised and unsupervised machine learning algorithms.
- Produced tutorials about tensor networks aimed at non-physicists using the python library TensorNetwork.
- Implemented algorithm based on Density Matrix Renormalization Ansatz (DMRG) for a classification task using Matrix Product States (MPS) from scratch.