



SAVERIO MONACO

Computational Physicist • Machine Learning Researcher

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EDUCATION

RWTH Aachen University & DESY

PhD in Quantum Generative models for High Energy Physics - ENGAGE
Marie Skłodowska-Curie PhD

Hamburg, Germany

Mar. 2024 – Present

• **Thesis:** Detector Simulation and Jet Clustering for HL LHC with Quantum Computing

University of Padua

M.Sc. in Computational Physics

Padua, Italy

Sep. 2020 – Sep. 2023

• **Thesis:** Study of Quantum Correlations in LHCb simulated heavy flavour jets

• **Honors:** Magna cum laude

University of Catania

B.Sc. in Physics

Catania, Italy

Sep. 2016 – Jul. 2020

• **Thesis:** Phase-Space Formulation of Quantum Mechanics

EXPERIENCE

Undergraduate Research Assistant

Texas A&M University

June 2020 – Present

College Station, TX

- Developed a REST API using FastAPI and PostgreSQL to store data from learning management systems
- Developed a full-stack web application using Flask, React, PostgreSQL and Docker to analyze GitHub data
- Explored ways to visualize GitHub collaboration in a classroom setting

Information Technology Support Specialist

Southwestern University

Sep. 2018 – Present

Georgetown, TX

- Communicate with managers to set up campus computers used on campus
- Assess and troubleshoot computer problems brought by students, faculty and staff
- Maintain upkeep of computers, classroom equipment, and 200 printers across campus

Artificial Intelligence Research Assistant

Southwestern University

May 2019 – July 2019

Georgetown, TX

- Explored methods to generate video game dungeons based off of *The Legend of Zelda*
- Developed a game in Java to test the generated dungeons
- Contributed 50K+ lines of code to an established codebase via Git
- Conducted a human subject study to determine which video game dungeon generation technique is enjoyable
- Wrote an 8-page paper and gave multiple presentations on-campus
- Presented virtually to the World Conference on Computational Intelligence

PROJECTS

Gitlytics | Python, Flask, React, PostgreSQL, Docker

June 2020 – Present

- Developed a full-stack web application using with Flask serving a REST API with React as the frontend
- Implemented GitHub OAuth to get data from user's repositories
- Visualized GitHub data to show collaboration
- Used Celery and Redis for asynchronous tasks

Simple Paintball | Spigot API, Java, Maven, TravisCI, Git

May 2018 – May 2020

- Developed a Minecraft server plugin to entertain kids during free time for a previous job
- Published plugin to websites gaining 2K+ downloads and an average 4.5/5-star review
- Implemented continuous delivery using TravisCI to build the plugin upon new a release
- Collaborated with Minecraft server administrators to suggest features and get feedback about the plugin

TECHNICAL SKILLS

Languages: Python, Julia, C/C++, SQL, R, VHDL, Agda, Nix

Developer Tools: Git, Docker, Vim

Libraries: PennyLane, Quimb, Jax, Keras, Pytorch, Pandas, NumPy, Matplotlib

PUBLICATIONS

2024 Exploring the Phase Diagram of the quantum one-dimensional ANNNI model

M. Cea, M. Grossi, **S. Monaco**, E. Rico, L. Tagliacozzo, S. Vallecorsa

arXiv pre-print

2023 Quantum phase detection generalization from marginal quantum neural network models

S. Monaco, O. Kiss, A. Mandarino, S. Vallecorsa, M. Grossi

Phys. Rev. B 107 (8) p. L081105. American Physical Society

2023 Study of quantum correlations in LHCb simulated heavy flavour jets

S. Monaco, D. Lucchesi, D. Zuliani, L. Sestini

thesis.unipd.it