

Carlos Gafa'

79453816 | gafacarlos3@gmail.com

EDUCATION

University of Malta

Micro-credential in Intelligent Algorithmic Trading (ARI5123) 2025 - Ongoing

- Relevant Coursework: Reinforcement Learning (DQN, Policy Gradient, A2C), Hidden Markov Models, Technical Analysis

Micro-credential in Financial Engineering (ARI5122) 2024 - 2025

- Grade: 89/100
- Relevant Coursework: PCA, Volatility Models (GARCH, GBM, RNNs), Factor Investing

University of Malta

Master of Science in Engineering (Electrical) (Research) 2024 – Pending Oral

- In collaboration with the Paul Scherrer Institute and the University of Cambridge
- Relevant Coursework: Optimization Algorithms, Inverse Methods, Data Analysis and Statistics

University of Malta

Bachelor of Science (Hons.) in Mathematics and Physics 2019 - 2023

- First Class Honors
- Dean's List of Science
- Relevant Coursework: Python Physics Simulations, Markov Chain Monte Carlo Methods, Data Analysis and Statistics

G.F. Abela – Junior College

Matriculation Certificate 2017 - 2019

- A' Levels in: Mathematics (A), Biology (A), Chemistry (A)

WORK EXPERIENCE

PricewaterhouseCoopers

Malta

Data Analyst

2024/11 – Ongoing

Key relevant experience:

- **Data Modelling:** Developed, and optimized data models for data warehousing initiatives to enhance data organization and performance.
- **Report Development:** Created and delivered insightful reports using tools such as Power BI to support strategic, data-driven decisions.
- **Data Cleaning Solutions:** Built robust data cleaning pipelines to ensure data accuracy and consistency across multiple projects.
- **Automation Tools:** Development of technology drive tools to automate financial risk calculations.
- **Technologies Used:** Python, SQL, Azure Data Factory, Power BI and Power Tools, Alteryx

Paul Scherrer Institute

Switzerland

Physicist

2023/09 – 2024/11

During my time with the Insertion Devices group at PSI, I played a key role in the High-Temperature Superconducting Undulator (HTSU) project, wherein:

- I was involved in FEM simulations,
- I developed a shimming algorithm targeted to the HTSU's needs,
- I developed algorithms to optimize the magnetic field integrals of the HTSU,
- I contributed to data analysis throughout the project, including identifying key KPIs to characterize the HTSU, fitting flux creep models, and fitting superconductor models through inverse analysis techniques.

Additionally, I spent three weeks at the University of Cambridge, where I assisted in upgrading the HTSU's measurement system.

My work was accepted as an oral contribution at the:

- HTS Modelling Workshop 2024
- Swiss Physical Society Meeting 2024

PricewaterhouseCoopers

Data Analyst

Malta

2022/06 – 2023/09 (Seasonal)

Peer Reviewed Publications

White Dwarf envelopes and temperature corrections in exponential $f(T)$ gravity

General Relativity and Gravitation

Dec 24, 2024

Abstract

Compact stars have long served as a test bed of gravitational models and their coupling with stellar matter. In this work the Tolman-Oppenheimer-Volkoff equation was solved for an exponential model in $f(T)$ gravity using Salpeter's equation of state. To obtain a more realistic behaviour, inputs from standard white dwarf evolutionary models are used to correct for core temperature and envelope thickness. Finally, constraints on the models' parameters are obtained using Markov Chain Monte Carlo methods, which are comparable to the results obtained using cosmological survey data. This consistency across the strong astrophysical and weak cosmological scales shows reasonable viability of the underlying model.

Experimental results of a YBCO bulk superconducting undulator magnetic optimization

Physical Review Accelerators and Beams

Oct 10, 2024

Abstract

The magnetic field optimization of RE-Ba-Cu-O (REBCO, RE=rare earth) bulk superconducting undulators is a fundamental step toward their implementation in an accelerator driven photon source, like a synchrotron or a free electron laser. In this article, we propose a sorting algorithm to reduce the undulator's phase error based on the reconstruction of the trapped current inside the bulks of a staggered array undulator. The results obtained with a YBCO short prototype field-cooled down to 10 K in a 10 T magnetic field are reported. Finally, its performance is critically discussed in light of 2D magnetic field maps of its individual components, obtained at LN2 after the magnetization tests.

Professional Certifications

Microsoft

Microsoft Certified: Azure Data Fundamentals

Credential ID: D9FE60CD73CB9710

2024/11