Mario Grandi

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Links

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Skills

- Python - C++ - Bash - MySQL - SQL - AWS - Git/GitHub/GitLab - Microsoft Excel - Tableau
- TensorFlow - Keras - Pandas - Scipy - Numpy - OpenCL - pyOpenCL - OpenMP - Vitis HLS
- Machine Learning - Statistics - Monte Carlo Simulations - Distributed Computing - Data Science Methods - Big-Data Analysis - Data Visualisation - Communication - Teamwork
- LaTeX- Microsoft Studio Office - Keynote
- Linux - Windows - macOS

Profile

I am an enthusiastic professional with a PhD in Experimental Particle physics and over 5 years of experience in developing software, performing statistical analyses, and implementing Machine Learning algorithms to deliver high-impact results.

Employment History

QA-UK Ltd, London, United Kingdom
Head of Analytics
May 2023 – ongoing (Fulltime)

- Led the research and analysis, from planning to deliverables, to investigate and prototype new green technologies for all the business' projects.
- Performed analyses on the data collected on all technologies to generate insight and support business decisions.
- Implemented and analysed complex fluid, thermal, and optical simulation using parallelisation techniques on AWS and large High-Performance Computing systems.
- Negotiated the implementation of software license extension, delivering 25% additional simulation time at no extra cost.
- Led the testing and analysis of a prototype for a multi-million dollar green energy project and presented results to investors and stakeholders.

Office for National Statistics, Titchfield, United Kingdom
Statistical Production Analyst
Sept 2022 – Mar 2023 (Fulltime Contractor)

- Co-led an 8-member team on the collection and analysis of international trade data to provide effective insights to over 5 external clients and 2 UK government branches, to make government-wide decisions and derive the national GDP.
- Improved code quality through automated testing, reviewing, and validation using Python, decreasing the team's workload by over 50% and overall production and preparation time by over two weeks.
- Produced clean and error-free Python code using Git for version control, to streamline data analysis and improve internal quality coding standards.
- Collaborated with 3 cross-platform professionals in an Agile environment and with a strict schedule, to oversee the successful delivery of requirements needed for a new software analysis platform.
- Identified several areas of improvement in the used statistical analysis methods and implemented cost-effective solutions.

University of Sussex, Brighton, United Kingdom
Post-Doctoral Research Fellow
Aug 2021 – Aug 2022 (Fulltime)

- Created a complex tracking algorithm in Python and C++, accelerated on FPGA hardware with HLS and on software using OpenCL and OpenMP.
- Achieved a processing latency reduction of $\times 15$ compared to software while occupying less than 50% of available hardware resources, a potentially groundbreaking improvement on existing implementations.
- Maintained Linux-based server system hosting accelerator cards interfaced with a distributed computing system to streamline computation.
- Used C++ and Python to perform statistical analyses on data and develop a statically accurate large-scale Monte Carlo physics simulator to test the performance of the algorithm.
- Successfully delivered the final product and presented final results to the funding agents and collaboration stakeholders, ensuring the programme's continued funding.

- Supported and trained master's and bachelor's physics students on the completion of their final year projects.

Public Health England, Cambridge, United Kingdom
Data Scientist
Jun 2019 – Sept 2019 (Internship)

- Used Python's Tensorflow and Keras libraries to develop and train a Machine Learning algorithm to learn the statistical properties patient's health data and generate a statistically similar anonymised synthetic dataset.
- Implemented multivariate analysis testing techniques in Python and Jupyter to define data integrity, data leakage, and statistical resemblance to inform the developed ML model and deliver a framework to the production team able to use the synthetic data to draw meaningful conclusions and provide actionable recommendations to stakeholders and research partners.
- Analysed and synthesised patient data with SQL tables, views, and Python Jupyter Notebooks to generate insightful reports on its statistical properties to the team and stakeholders.
- Provided comprehensive documentation for whole system's analysis, testing, and implementation for production team handover.

University of Sussex, Brighton, United Kingdom
High Energy Physics PhD Researcher
Sept 2017 – Jul 2021 (Fulltime)

- Performed large-scale statistical data analysis using data science methods on petabytes of data, collected by the ATLAS experiment at CERN, to perform feature extraction, data cleaning and transformation, and maximise experimental sensitivity.
- Developed and implemented C++, Python, and Bash codes, maintained with CI/CD and GitLab, to perform cut-based statistical analyses and machine learning based identification and discriminate for extremely rare physics events from large background noise.
- Received extensive training in big data analysis, machine learning, and high-performance computing techniques through the DISCnet bursary programme.
- Maintained and improved a large analysis framework using coding best practices and large-scale project management with JIRA and GitLab to resolve bugs and issues quickly and effectively.
- Presented the performed work at several workshops, group meetings, and international conferences.
- The results of my analyses have been published in several respected physics journals.

Education

PhD in Particle Physics, University of Sussex
(Doctorate) Sept 2017 – Jul 2021
Search for supersymmetry with the ATLAS detector at the Large Hadron Collider in final states with two hadronically decaying τ-leptons.

MPhys in Physics and Astrophysics, University of Sussex
(Masters) Sept 2013 – Aug 2017
Grade: 1st class degree with honours.

International Baccalaureate, International School of Geneva
(Ceritificate of Education) Sept 2011 – Aug 2013
Grade: 34
Higher Level subject: Physics, Mathematics, Economics
Standard Level subjects: English, Spanish, Chemistry

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Languages

- English (Native)
- Italian (Native)
- French (Advanced)
- Spanish (Intermediate)

Interest and Accomplishments

- Analysed heath data collected by Terre Innovative Healthcare P.A.N.D.A. project to derive insight to better understand pregnancy related issues in rural countries and areas.
- Developed, trained, and tested a CNN Machine Learning algorithm to automatically identify brain vesicles dyed with chemical compounds for Alzheimer's identification.
- Winner of the Outreach Activity Project at the 2019 European School of High Energy Physics.
- awarded the All-round Middle Year Program Student" award.
- Annual collaboration with Progetti ECAR Mandabe to organise fund-raising events for the village of Mandabe in Madagascar.