FabrizioMiano

Ph.D. candidate / Junior Data Scientist

Contacts

fabriziomiano@gmail.com
+447478953812
Brighton, UK

Profiles

Personal Website
LinkedIn Profile
Sussex Uni Profile
gitlab.com/fabriziomiano

Computing

Python, C++, HTML, Bash, Monte Carlo simulations, LaTeX, Mac OS, UNIX, Windows, Office Suite

Volunteering

HiSPARC, #ScienceOnBuses, Brighton Science Festival, CERN Masterclass

Teaching

Associate Tutor of Classical Physics and Electromagnetism; Properties of Matter

Languages

Italian Mother tongue
English Fluent
Spanish Fluent
French Basic

Professional Skills

By the end of my PhD I won a 3-month grant to work on an AI project: the development of an algorithm capable of performing image recognition within a given dataset. I have spent 4 months working for Deckchair.com developing such an algorithm. In particular, two of the approaches that have been developed are; a statistical tool that exploits the structural similarity index (OpenCV, skimage) to select only interesting images; a machine learning tool (sklearn, keras, Tensorflow), in particular a support vector machine, for image classification.
During my PhD the main skills I have developed are related to dealing with high-rates and high-volumes of data collected with the ATLAS detector at CERN, Geneva. Signal extraction algorithms, signal-over-background optimisations (Python) modelling of regions of control (C++) were at the heart of the analyses I have carried out. Additionally I have been involved in the development of monitoring tools for the ATLAS Inner Detector Trigger using databases.

Research Experience

2018–Now **University of Sussex** Brighton, UK

Junior Data Scientist - Placement in collaboration with Deckchair.com
Development of a computer vision algorithm. Detailed involvement:

- Development of a statistical tool to detect interesting images within a dataset using Structural Similarity Index analysis (opencv, sklearn);
- Feature extraction via k-Means clustering (sklearn) to perform image classification using SVM and Tensorflow (keras, Inception V3);

2014–2018 **University of Sussex and CERN** Brighton, UK / Geneva, Switzerland

Doctoral Position
Supersymmetry searches at the LHC with the ATLAS detector
Detailed involvement:

- Developed Python code to perform multi-variable signal-over-background optimisations to define new kinematic signal regions that enhanced signal contribution while discriminating against SM background processes
- Modelling of Standard Model backgrounds using custom C++ framework for `ROOT` n-tuple production to define control regions for the main backgrounds
- Data-Driven estimation of the *irreducible* background and evaluation of related theory uncertainties

Performance of the ATLAS Inner Detector Trigger
Detailed involvement:

- Participation in the development of vertex reconstruction algorithm (C++)
- Validation of the changes to the used framework before release
- Monitoring of the performance of the tracking and reconstruction efficiencies

Development of the Trigger EDM Size Monitoring Python tool
Detailed involvement:

- Development of a monitoring tool (Python) and HTML code to display the results of the monitoring (plots, tables) on a web page

2013–2014 **Università degli Studi di Catania** Catania, Italy
MSc INFN-funded project
Monte Carlo simulations of protons emission and space-time characterisation in heavy-ion collisions

- Developed C++ code to simulate physical distributions of the emission of protons from a nuclear source of a given size and life-time
- Validation of the simulations
- Deduction of the geometrical size and life-time of a nuclear source created in a heavy-ion collision at intermediate energy using data collected with the LASSA detector of the NSCL, Michigan, US.

Education

Current **PhD** in Experimental Particle Physics University of Sussex, UK / CERN, Switzerland
Search for supersymmetry at LHC with ATLAS detector
The performance of the Inner Detector Trigger of the ATLAS detector

2009–2014 **MSc** in Experimental Nuclear Physics Università degli Studi di Catania, Italy
Protons emission and space-time characterisation in heavy-ion collisions

2005–2009 **BSc** in Physics Università degli Studi di Catania, Italy
Study of neutrons spectra emitted by Am-Be and Pu-Be radioactive sources

Communication Skills

2017 **15' Conference Talk** Phenomenology 2017, Pittsburgh, PA, USA
Searches for direct production of third generation squarks with the ATLAS detector

2016 **Conference Poster** ICHEP 2016, Chicago, IL, USA
The Design and performance of the ATLAS Inner Detector Trigger for Run 2 collisions at $\sqrt{s} = 13$ *TeV*

2015 **Poster** STFC HEP Summer School, Lancaster, UK
Search for direct pair production of the top squark in all-hadronic final states in pp *collisions with the ATLAS detector*

2014 **20' Graduation Talk** Università degli Studi di Catania, Italy
Protons emission and space-time characterisation in heavy-ion collisions

Workshops and Schools

2017 **CERN European School of High-Energy Physics** Evora, Portugal
The European School is targeted particularly at students in experimental High-Energy Physics who are in the final years of work towards their PhDs

2016 **International ATLAS SUSY Workshop** Brighton, UK
One-week long workshop about the definition of the strategies for the Supersymmetry searches at ATLAS

2015 **STFC High-Energy Physics Summer School** Lancaster, UK
A two-week long school on theoretical and phenomenological High-Energy Physics

2013 **WPCF 2013 - IX Workshop on Particle Correlations and Femtoscopy** Catania, Italy
A three-day long workshop on particle-particle correlations and "femtoscopy" in Nuclear and Particle Physics

Awards

2016 **Grant** University of Sussex, UK
Doctoral Overseas Conference Grant for Postgraduate Researchers

2015 **Scholarship** STFC, UK
4-years STFC-funded PhD scholarship in collaboration with CERN

2013 **Scholarship** INFN-LNS, Italy
1 year INFN-funded scholarship in collaboration with LNS

Articles in peer-reviewed journals

Performance of the ATLAS trigger system in 2015
The ATLAS Collaboration
The European Physical Journal C *77.5 (May 2017) p. 317. 2017*

Search for a scalar partner of the top quark in the jets plus missing transverse momentum final state at $\sqrt{s}$=13 TeV with the ATLAS detector
The ATLAS Collaboration
JHEP *12 (2017) p. 085. 2017*

Search for dark matter produced in association with bottom or top quarks in $\sqrt{s}$ = 13 TeV pp collisions with the ATLAS detector
The ATLAS Collaboration
The European Physical Journal C *ICHEP2016 (2016) p. 856. 2016*

Search for the Supersymmetric Partner of the Top Quark in the Jets+$E_{\mathrm{T}}^{\mathrm{miss}}$ Final State at $\sqrt{s} = 13$ TeV
The ATLAS Collaboration
CERN Document Server *(2016). 2016*

International peer-reviewed conferences/proceedings

The design and performance of the ATLAS Inner Detector trigger for Run 2 LHC collisions at $\sqrt{s} = 13$ TeV
F. Miano for the ATLAS Collaboration
Proceedings, 38th International Conference on High Energy Physics (ICHEP 2016): Chicago, IL, USA, August 3-10, 2016