Fabrizio **Miano**

Data Scientist · ML & AI · DevOps

Catania, Italy

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Overview

ML Engineer, Full-stack Python developer, and System administrator at R2M Solution focused on research activities within the scopes of robotics, artificial intelligence, big data, energy saving, and IoT domains.

Previously Data Scientist at Leonardo working on a number of projects within the scopes of public administration, energy market, and defence. The projects I have been involved in required expertise on data crawling, text, audio, and image processing, as well as team management, project coordination time- and budget-wise. I briefly worked as a Research Fellow at the University of Sussex where I was focusing on the development of a machine learning algorithm for the classification of video of trials as truthful/deceptive.

In 2018 I graduated as a PhD in Experimental Particle Physics at the University of Sussex where I developed skills such as, problem solving, time management, coding (Python, C++, HTML, shell), to carry out data analysis of high rates and volumes of data collected by the ATLAS Experiment at the Large Hadron Collider (CERN, Geneva). During my PhD I have been invited to give talks at national (UK), and international (US), conferences; I have also participated in outreach activities to engage with the general public.

Industrial Experience

R2M Solution

Catania, Italy

IT Engineer — *Jan 2020 – Now*

- Data crawling: development of a Python tool to scrape LinkedIn jobs and user profiles
- System administrator for internal tools and partner solutions
- Technical activities in research projects within the robotics, artificial intelligence, big data, energy saving, and IoT domains
- Deliver high quality reports for research and innovation projects

Leonardo

Catania, Italy

Data Scientist - AI Development — *Jan 2019 – Now*

- Data crawling: development of a Python tool to scrape LinkedIn jobs and user profiles
- Recommendation engine: development of a job-user recommendation system
- Computer Vision: development of a WebApp to perform real-time object detection using YOLO
- NLP: development of a deep-learning tool to extract the objects seized to criminal organizations from legal verdicts
- Social-network Analysis: named-entity extraction and sentiment analysis on Facebook-post comments
- Creation and management of micro-services on Azure

Deckchair.com

Brighton, UK

Junior Data Scientist — *Jun – Aug 2018*

- Development of a statistical tool to select interesting images within a dataset;
- Design of a ML tool to classify grey sky and sunset images;

Academic Experience

University of Sussex

Brighton, UK

Post-Doctoral Research Fellow in Data Science — *Sep – Dec 2018*

- Development of ML model to classify videos of trials as Truthful/Deceptive
- Exploration of potential collaboration with other areas of research:
  - Evolutionary and Adaptive Systems Research Group
  - Industrial IT and Signal Processing Research Group
  - Sensor Technology Research Centre

University of Sussex / CERN

Brighton, UK / Geneva, Switzerland

Doctoral Position — *Nov 2014 – Oct 2018*

- Developed Python code to perform multi-variable signal-over-background optimizations to define signal-enriched regions to enhance signal contribution while discriminating against background
- Modelling of main backgrounds using custom C++ framework
- Data-Driven estimation of an *irreducible* background and evaluation of related theory uncertainties (C++, Python, Excel)
- Participation in the development and commissioning of vertex reconstruction algorithm (C++)
- Validation of the changes to the used framework before release
- Monitoring of the performance of the tracking efficiency
- Development of a monitoring tool (Python) to display the results of the monitoring (plots, tables) on a web page (HTML)

Università degli Studi di Catania *Catania, Italy*

MSc INFN-funded project *Mar 2013 – Jul 2014*

- 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

University of Sussex / CERN *Brighton, UK / Geneva, Switzerland*

PhD in Experimental Particle Physics *2015–2018*

Optimisation studies and data-driven background estimation in searches for the supersymmetric partner of the top quark with the ATLAS Detector at the LHC

Università degli Studi di Catania *Catania, Italy*

MSc in Experimental Nuclear Physics *2009–2014*

Protons emission and space-time characterisation in heavy-ion collisions

Università degli Studi di Catania *Catania, Italy*

BSc in Physics *2005–2009*

Study of neutrons spectra emitted by Am-Be and Pu-Be radioactive sources

Skills

Data Science	`sklearn, skimage, Keras, pandas, numpy, OpenCV, spaCy, NLTK, librosa, selenium, BeautifulSoup`
Languages	`Python, Bash, C/C++, HTML, LaTeX, JavaScript`
Web App Dev	Flask, Django, gunicorn, NGINX
Versioning	Git, SVN
Database	MongoDB, SQL
Dev Ops	Docker, Azure: WebApp, Function App, CosmosDB, EventHub, Azure CLI
Office Suite	Word, Excel, PowerPoint
OSs	Linux, macOS, MS Windows
Teaching	Data-science group mentor; Classical Physics and Electromagnetism; Properties of Matter
Languages	English (Fluent), Spanish (Fluent), Italian (Mother tongue), French (Basic)

Public Speaking

DISCnet showcase *Royal Society, London, UK*

"From Particle Physics to Computer Vision" *Dec 2018*

10-min talk on the ML tool developed for Deckchair.com

HLT-UK Internal Meeting *University of Oxford, UK*

"HLT tracking performance" *Sep 2017*

15-min talk: Presented the result of the performance of the tracking of the ATLAS Inner detector

Phenomenology 2017 *Pittsburgh, PA, USA*

"Searches for direct production of third generation squarks with the ATLAS detector" *May 2017*

15-min talk: Presented the results of the searches for third-generation squarks on behalf of the ATLAS Collaboration

International Conference on High Energy Physics (ICHEP) 2016 *Chicago, IL, USA*

"The Design and performance of the ATLAS Inner Detector Trigger for Run 2 collisions at $\sqrt{s} = 13$ TeV" *Aug 2016*

Poster presented on behalf of the ATLAS Collaboration: Results of the performance of the ATLAS Inner Detector

STFC HEP Summer School *Lancaster, UK*

"Direct pair production of the top squark in all-hadronic final states in *pp* collisions with the ATLAS detector" *2015*

Poster: preliminary results of the optimisation of the regions of interest for the search of the supersymmetric partner of the top quark

Awards

2018	**Post-doctoral Fellowship**, STFC Impact Acceleration Account	*Brighton, UK*
2018	**Grant**, DISCnet	*Brighton, UK*
2016	**Doctoral grant**, Doctoral Overseas Conference Grant for Postgraduate Researchers	*Chicago, IL, USA*
2015	**Scholarship**, 4-year PhD scholarship in collaboration with CERN	*CERN, Switzerland*
2013	**Scholarship**, 1-year MSc scholarship in collaboration with LNS	*Catania, Italy*

Outreach

Jun 2018	**#ScienceOnBuses,** Participated in filming and engaged people on buses about CERN research activities	*Brighton, UK*
Nov 2017	**HiSPARC,** Helped middle school student build a scintillator for cosmic-ray detection	*Brighton, UK*
May 2016	**CERN Master class,** Talked to a high-school students audience about "The life of a PhD student at CERN"	*CERN, Switzerland*
Feb 2015	**Brighton Science Festival,** Engaged kids through games related to particle physics	*Brighton, UK*

Publications

International peer-reviewed conferences/proceedings

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

PhD Thesis

[2] Fabrizio Miano and Fabrizio Salvatore. "Optimisation studies and data-driven background estimation in searches for the supersymmetric partner of the top quark with the ATLAS Detector at the LHC". Presented 28 Sep 2018. Sept. 2018. URL: http://cds.cern.ch/record/2650559.

Articles in peer-reviewed journals

[3] The ATLAS Collaboration. "Performance of the ATLAS trigger system in 2015". In: *The European Physical Journal C* 77.5 (May 2017), p. 317. ISSN: 1434-6052. DOI: 10.1140/epjc/s10052-017-4852-3. URL: https://doi.org/10.1140/epjc/s10052-017-4852-3.

[4] The ATLAS Collaboration. "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". In: *JHEP* 12 (2017), p. 085. DOI: 10.1007/JHEP12(2017)085. arXiv: 1709.04183 [hep-ex].

[5] The ATLAS Collaboration. "Search for dark matter produced in association with bottom or top quarks in $\sqrt{s}$ = 13 TeV pp collisions with the ATLAS detector". In: *The European Physical Journal C* ICHEP2016 (2016), p. 856. eprint: 1710.11412. URL: https://doi.org/10.1140/epjc/s10052-017-5486-1.

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