

Fabrizio Miano

DATA SCIENTIST · SPECIALISING IN ML AND AI

Catania, Italy

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Overview

I am a Data Scientist at Leonardo working on a number of AI projects within the scopes of energy market, public administration, and security, mainly focusing on computer vision, text mining, and natural language processing. Previously, as a Research Fellow at the University of Sussex, I was focusing on the development of an AI capable of classifying video of trials as truthful/deceptive. I did a PhD in Experimental Particle Physics at the University of Sussex where I developed skills such as, problem solving, time management, and especially how to deal with high rates and high volumes of data from particle collisions collected with the ATLAS detector at the Large Hadron Collider (LHC) of CERN, Geneva.

Industrial Experience

Leonardo

DATA SCIENTIST - AI DEVELOPMENT

- Energy market: correlation and forecast
- Public administration, and Security: Text mining, Computer vision

Catania, IT

Jan 2019 – Now

Deckchair.com

JUNIOR DATA SCIENTIST

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

Brighton, UK

Jun – Aug 2018

Academic Experience

University of Sussex

POST-DOCTORAL RESEARCH FELLOW IN DATA SCIENCE

- 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 Informatics and Signal Processing Research Group
 - Sensor Technology Research Centre

Brighton, UK

Oct – Dec 2019

University of Sussex / CERN

DOCTORAL POSITION

- Developed Python code to perform multi-variable signal-over-background optimisations 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 efficiencies
- Development of a monitoring tool (Python) to display the results of the monitoring (plots, tables) on a web page (HTML)

Brighton, UK / Geneva, Switzerland

Nov 2014 – Oct 2018

Università degli Studi di Catania

MSC INFN-FUNDED PROJECT

- 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.

Catania, Italy

Mar 2013 – Jul 2014

Education

University of Sussex / CERN

PHD IN EXPERIMENTAL PARTICLE PHYSICS

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

Brighton, UK / Geneva, Switzerland

2015–2018

Università degli Studi di Catania

MSC IN EXPERIMENTAL NUCLEAR PHYSICS

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

Catania, Italy

2009–2014

Università degli Studi di Catania

BSc IN PHYSICS

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

Catania, Italy

2005–2009

Skills

ML Tools	scikit-learn, Keras
Computer Vision	scikit-image, OpenCV, Image
Programming	Python, C/C++, JAVA, Bash, LaTeX
Office Suite	Word, Excel, PowerPoint
OSs	Linux, macOS, MS Windows
Teaching	Classical Physics and Electromagnetism; Properties of Matter
Languages	English (Fluent), Spanish (Fluent), Italian (Mother tongue)

Public Speaking

DISCnet showcase

“FROM PARTICLE PHYSICS TO COMPUTER VISION”

10-min talk on the AI software developed for Deckchair.com

Royal Society, London, UK

Dec 2018

HLT-UK Meeting

“HLT TRACKING PERFORMANCE”

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

University of Oxford, UK

Sep 2017

Phenomenology 2017

“SEARCHES FOR DIRECT PRODUCTION OF THIRD GENERATION SQUARKS WITH THE ATLAS DETECTOR”

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

Pittsburgh, PA, USA

May 2017

International Conference on High Energy Physics (ICHEP) 2016

“THE DESIGN AND PERFORMANCE OF THE ATLAS INNER DETECTOR TRIGGER FOR RUN 2 COLLISIONS AT $\sqrt{s} = 13$ TeV”

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

Chicago, IL, USA

Aug 2016

STFC HEP Summer School

“DIRECT PAIR PRODUCTION OF THE TOP SQUARK IN ALL-HADRONIC FINAL STATES IN pp COLLISIONS WITH THE ATLAS DETECTOR”

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

Lancaster, UK

2015

Università degli Studi di Catania

“EMISSION OF PROTONS AND SPACE-TIME CHARACTERISATION IN HEAVY-ION COLLISIONS”

20-min talk: presented final-year research project

Catania, Italy

2014

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

Articles in peer-reviewed journals

- [2] 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>.
- [3] 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].
- [4] 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>.
- [5] The ATLAS Collaboration. “Search for the Supersymmetric Partner of the Top Quark in the Jets+ E_T^{miss} Final State at $\sqrt{s} = 13$ TeV”. In: *CERN Document Server* (2016).

International peer-reviewed conferences/proceedings

- [1] 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*.