Andrea **Barontini**

PH.D. IN THEORETICAL PHYSICS · EMBEDDED SOFTWARE ENGINEER

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Summary

I'm Andrea, Ph.D in theoretical physics with a passion for computer science. With 3+ years of experience in software development and artificial intelligence with Python, I am currently working in the field of virtual and augmented reality in the Unity framework.

Personal Informations

Birth	1997, Latina, Italy
Nationality	Italian
Gender	Male
Languages	Italian (native), English (fluent)

Work Experience

Capgemini

Rome, Italy

EMBEDDED SOFTWARE ENGINEER — *Oct. 2024 - Current*

- Working on systems based on virtual and augmented reality in the Unity framework, following the entire development process, from designing to testing.
- Proposing R&D solutions based on AI and deep learning. In particular, I am currently working on voice authentication, time-series forecasting and supervised models for the analysis of multi-dimensional data.
- Integrating and managing the CI-CD of the project by writing pipelines and managing containers.

Ph.D. Researcher

Milan, Italy

UNIVERSITY OF MILAN — *Oct. 2021 - Current*

- Worked in Neural Networks applications within the NNPDF international collaboration to the challenging theoretical topic of determining the internal structure of the proton.
- Supervised master's theses on the topic of AI explainability resulting in a set of analysis tools for a Neural Network application.
- Contributed to a set of open source software tools used now by the high energy physics community.

Education

Master's degree in Theoretical Physics

Rome, Italy

LA SAPIENZA UNIVERSITY OF ROME — *Oct. 2019 - Oct. 2021*

- Field of study: Theoretical particle physics, Computational physics
- Grade: 110/110 cum laude
- Achievement: grade based scholarship maintained for the entire duration of the course

Bachelor's degree in Physics

Rome, Italy

LA SAPIENZA UNIVERSITY OF ROME — *Sep. 2016 - Oct. 2019*

- Grade: 110/110 cum laude
- Achievement: grade based scholarship maintained for the entire duration of the course

Skills

Software Skills	Tensorflow, PyTorch, Keras, Pandas, Scipy, Numpy, Microsoft Office, Pytest, Git, Github, Unity, Microsoft Visual Studio
Programming Languages	C, C++, C#, Python, BASH
Operating Systems	Ubuntu, MacOs, Windows, Kali Linux, Scientific Linux
Other skills	Continuous integration and delivery, Automation testing, Keynote
Certifications	*Unity: Game Design and Development 1*; *Unity: Game Design and Development 2*; *The Ultimate Guide to Video Game Optimi* *Cutting-Edge AI: Deep Reinforcement Learning in Python*; *Become a Tensorflow Professional Developer*; *Qt5 Core for Beginne* *C++*; *Ready, Set, Qt!*; *Complete Modern C++ (C++ 11/14/17)*; *Design Patterns in Modern C++*

Publications

The Path to N3LO Parton Distributions

2402.18635 *Feb, 2024*

Determination of the theory uncertainties from missing higher orders on NNLO parton distributions with percent accuracy

2401.10319 *Jan, 2024*

Photons in the proton: implications for the LHC

2402.18635 *Jan, 2024*

Pineline: Industrialization of high-energy theory predictions

Comput.Phys.Commun. 297 (2024) 109061 *Dec, 2023*

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Presentations

The inclusion of theory errors in PDF fitting

Journal club at University of Rome La Sapienza, Rome, Italy *Mar, 2024*

Extraction of the strong coupling with HERA and EIC inclusive data

ECT*, Trento, Italy *Feb, 2024*

The inclusion of theory errors in PDF fitting

Desy Research Center, Hamburg, Germany *Jan, 2024*

NNPDF40: Neural networks techniques for parton distribution functions evaluation

ECT*, Trento, Italy *Nov, 2023*

The Pineline: industrialization of High-Energy theory predictions

Durham, UK *Sep, 2023*

The inclusion of theory errors in PDF fitting

QCD@LHC, Durham, UK *Sep, 2023*

The inclusion of theory errors in PDF fitting

QCD23, Montepellier, France *Jul, 2023*

Teaching Activity

2024	**Tutor and exerciser**, Mathematical methods for physics	*University of Milan*
2024	**Tutor and Exerciser**, Quantum mechanics 1	*University of Milan*
2023	**Tutor and Exerciser**, Quantum mechanics 2	*University of Milan*
2023	**Tutor and Exerciser**, Informatics	*University of Milan*
2022	**Tutor and Exerciser**, Quantum mechanics 1	*University of Milan*
2022	**Tutor and Exerciser**, Informatics	*University of Milan*
2022	**Tutor and Exerciser**, Quantum mechanics 2	*University of Milan*