Andrea **Amico**

PhD in Physics

✉: amico.andrea.90@gmail.com | ☎: +39 3357449618 | In: linkedin.com/in/andrea-amico-90/
website: https://www.andreaamico.eu | Github: https://github.com/andreaamico

"Problem-solving is what I enjoy the most. I have a scientific mindset and a great passion for programming. During my Ph.D. studies I published in several top scientific journals and I worked with world-leading scientists including the Nobel Laureate Professor Wolfgang Ketterle. I'm currently interested in data science, machine learning, and artificial intelligence."

Work experience

2019-present	**DATA SCIENTIST** **Plan Soft s.r.l.** ○ Application of reinforcement learning in retail industry ○ Development of proposals for artificial intelligence projects (transport, pharmaceutical and electric power distribution industries) ○ Machine learning trainer for global companies ○ NLP project - text classification with BERT using ASW services
2015-1019	**Researcher in the ultracold atoms field** **LENS, INO-CNR** ○ Data analysis ○ Quantum magnetism in Fermi gases ○ Superfluidity and Josephson effect
2018-2019	**University tutor** in Classical Mechanics and Quantum Physics
2015-2018	**Python freelance programmer** ○ Development of a control program for infrared laser interferometry scanner (Structural Diagnosis in Art Conservation)
2015	**CNR-INO internship** "Development of two-dimensional trapping potential for ultracold atoms" ○ Data analysis ○ Construction of a laser optical setup for holography atom trapping

Tecnical skills

Skill Set:

- Statistical Methods for Data Science
- Data Collection & Processing
- Optimization & Evaluation Algorithms
- Statistical Learning
- Machine Learning
- Reinforcement learning
- Data Mining
- Numerical Analysis
- Data Management
- Data Visualization
- Simulations via Monte Carlo methods

Technologies:

- Scientific Python (Anaconda, Numpy, SciPy, Pandas, SciKitLearn)
- Data Visualization: Matplotlib
- Data management: SQL, NO SQL DB, JSON, YAML, XML, CSV
- Deep learning frameworks (tensorflow, keras, pytorch, fastai)

- Computer vision: OpenCV
- Graphics: Blender (3D graphics), Inkscape (vector graphics editor), GIMP and Photoshop (raster graphics editors), Unity (C# game engine)
- Office suite core (word, excel, powerpoint)
- Engineering software: OSLO (optical design program), LabView (Laboratory Virtual Instrument Engineering Workbench)
- Markup languages: HTML, LaTeX.
- Other programming languages: C, C#, Wolfram Mathematica, MATLAB.

Education

2015-2019	Ph.D. student in Physics University of Florence LENS laboratories: European Laboratory for Non-Linear Spectroscopy Thesis title: “Probing the many body dynamics of ultracold repulsive Fermi gasses.
2012-2015	2ND LEVEL – Master degree in Physics and Astrophysics University of Florence, Italy Final degree mark : **110/110 cum laude** Thesis title: “Measurement of the equation of state of superfluid Fermi gases of Li-6 atoms”
2009-2012	1ST LEVEL – Degree/bachelor in Physics and Astrophysics University of Florence, Italy Final degree mark : **110/110 cum laude** Thesis title: “Production of optical potentials using phase plates for ultracold atom trapping”.
	Summer schools ○ International school of Physics “Enrico Fermi”, Quantum matter at ultralow temperatures (2014 - Italy) ○ Les Houches summer school, Current trends in atomic physics (2016 - France) ○ Granada Summer School,Quantum matter out of equilibrium (2017 - Spain)

Online certificates

2020	Coursera Specialization - Natural Language Processing - 4 courses (DeepLearning.ai) ○ Natural Language Processing with Classification and Vector Spaces ○ Natural Language Processing with Probabilistic Models ○ Natural Language Processing with Sequence Models ○ Natural Language Processing with Attention Models As part of this Specialization, you have learned the classical machine learning skills and the state-of-the-art deep learning techniques needed to build NLP systems. You are now equipped to design applications that perform question-answering and sentiment analysis, create tools to translate languages and summarize text, and build chatbots! These, and other NLP applications, are going to be at the forefront of the coming transformation to an AI-powered future. https://www.coursera.org/account/accomplishments/specialization/certificate/JDKVPHJ9RUAQ
2020	Coursera Specialization- Reinforcement Learning - 4 courses University of Alberta, Alberta Machine Intelligence Institute: ○ Fundamentals of Reinforcement Learning ○ Sample-based Learning Methods ○ Prediction and Control with Function Approximation ○ A Complete Reinforcement Learning System (Capstone) The Reinforcement Learning Specialization consists of 4 courses exploring the power of adaptive learning systems and artificial intelligence (AI). In this specialization, learners were ought to: Build a Reinforcement Learning system for sequential decision making; understand the space of

	Reinforcement Learning algorithms (Temporal- Difference learning, Monte Carlo, Sarsa, Q-learning, Policy Gradients, Dyna, and more); understand how to formalize a task as a Reinforcement Learning problem, and how to begin implementing a solution; understand how RL fits under the broader umbrella of machine learning. This learner is now prepared to take more advanced courses in AI or apply AI tools to real world problems. https://www.coursera.org/account/accomplishments/specialization/certificate/FREYZSAEQP42
2020	Coursera Specialization - Advanced Data Science with IBM - 4 courses ○ Fundamentals of Scalable Data Science ○ Advanced Machine Learning and Signal Processing ○ Applied AI with DeepLearning ○ Advanced Data Science Capstone As a coursera certified specialization completer you will have a proven deep understanding on massive parallel data processing, data exploration and visualization, and advanced machine learning & deep learning. You'll understand the mathematical foundations behind all machine learning & deep learning algorithms. You can apply knowledge in practical use cases, justify architectural decisions, understand the characteristics of different algorithms, frameworks & technologies & how they impact model performance & scalability. https://www.coursera.org/account/accomplishments/specialization/certificate/DJLT7P9LQR3T
2020	Duke University - Statistics with R Specialization - 3 courses ○ Inferential Statistics ○ Introduction to Probability and Data with R ○ Linear Regression and Modeling https://www.coursera.org/account/accomplishments/certificate/UYG2SS29RQ8R https://www.coursera.org/account/accomplishments/certificate/368SHB8QV6KP https://www.coursera.org/account/accomplishments/certificate/YEDRRZ6U3PCY
2018	Coursera Specialization - Deep Learning - 5 courses (DeepLearning.ai) ○ Neural Networks and Deep Learning ○ Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization ○ Structuring Machine Learning Projects ○ Convolutional Neural Networks ○ Sequence Models The Deep Learning Specialization is designed to prepare learners to participate in the development of cutting-edge AI technology, and to understand the capability, the challenges, and the consequences of the rise of deep learning. Through five interconnected courses, learners develop a profound knowledge of the hottest AI algorithms, mastering deep learning from its foundations (neural networks) to its industry applications (Computer Vision, Natural Language Processing, Speech Recognition, etc.). *https://www.coursera.org/account/accomplishments/specialization/certificate/57RRQV9W2BV6*
2018	Udemy - “Complete C# Unity Developer 2D” https://www.udemy.com/certificate/UC-HEYLMGCI/
2018	Udemy - “The Complete Web Developer Course 2.0 by Rob Percival” (HTML, CSS, Javascript, jQuery,CMSs and WordPress, PHP and MySQL Databases)
2016	Coursera - University of Michigan: “Using Python to Access Web Data” USA (MI) (Regex, XML,JSON, RESt and GeoJSON API)
2015	MITx - Massachusetts Institute of Technology: “6.00.2x - Introduction to Computational Thinking And Data Science” USA (MA)
2015	MITx - Massachusetts Institute of Technology: “6.00.1x - Introduction to Computer Science and Programming Using Python” USA (MA)

2014	Coursera - California institute of the arts: “Introduction to programming for musicians and digital artists” USA (CA) *https://courses.edx.org/certificates/1afbbe31140e436088b704c697854f01*
2013	Coursera - Rice University: “An introduction to interactive Programming in Python” USA (TX) *https://courses.edx.org/certificates/5c9b08f909494caba471c6be86e704b3*

Top Publications

2020	F. Scazza, et al. (2020). Exploring emergent heterogeneous phases in strongly repulsive Fermi gases. **Physical Review A**, 101(1), 013603.
2018	A. Amico, et al. "Time-resolved observation of competing attractive and repulsive short-range correlations in strongly interacting Fermi gases." **Physical review letters** 121.25 (2018): 253602.
2018	A. Burchianti, et al. “ Connecting Dissipation and Phase Slips in a Josephson Junction between Fermionic Superfluids”. **Phys. Rev. Lett.** 120, 025302 – 12 January 2018
2017	Andrea Amico. Experiments on the ferromagnetic behavior of atomic repulsive Fermi gases. **Il Nuovo Cimento C**, (2):1, August 2017.
2017	F. Scazza, et al. “Repulsive Fermi Polarons in a Resonant Mixture of Ultracold Li 6 Atoms.” **Physical Review Letters**, 118(8), February 2017.
2017	G. Valtolina, et al. “Exploring the ferromagnetic behaviour of a repulsive Fermi gas through spin dynamics”. **Nature Physics**, 13(7):704–709, April 2017.
2015	G. Valtolina, et al. “Josephson effect in fermionic superfluids across the BEC-BCS crossover” – **Science** 18 Dec 2015: Vol. 350, Issue 6267, pp. 1505-1508DOI: 10.1126/science.aac9725

Talks and Conferences

2017	INO annual symposium 2017 - Trento ○ Poster presentation: ”Spin dynamics and collective excitations in ultracold repulsive Fermi gases”
2017	CLEO - Conference on lasers and electro-opticsMunich, Germany ○ Talk: ”Spin response and metastability of a strongly repulsive Fermi gas of ultracold atoms”Quantum science approaches to strongly correlated systems: from ultracold atoms to high-energy and condensed matter physics
2017	GGI - Florence, Italy ○ Poster presentation: ”Spin response and metastability of a strongly repulsive Fermi gas of ultracold atoms”
2017	SUPER FLUCTUATIONS: Fluctuations and Highly Nonlinear Phenomena in Superfluids and Superconductors - San Benedetto del Tronto, Italy ○ Poster presentation: ”Repulsive Fermi polarons in a mass-balanced mixture at a broad Feshbach resonance” ○ **Springer Nature Awards for best poster presentations**.
2017	SIF - 103° congress of Italian Physical SocietyTrento, Italy ○ Short communication: ”Probing the spectral response of ultracold Fermi gases after quench to strong repulsive interactions.”
2016	SIF - 102° congress of Italian Physical Society - Padova, Italy ○ Short communication: ”Ferromagnetism of a repulsive Fermi gas”

- **Second best communication award**

Languages

- Italian: native speaker
- English: fluent

Volunteer Experience

2016-2018	F-LIGHT festival - Science Divulgation I attended several public events for scientific dissemination. I presented to the general public, mostly children from primary and secondary schools, the concept of color from a physical point of view: how the human eye perceives different photon wavelengths, and how the primary colors can be added and subtracted from each other to obtain the full spectra of visible colors.
2016-2017	ScienEstate I trained high school students to present to the public simple experiments about light which show how the photon energy is connected to the human perception of colors.

Personal projects

2018-present	Musical Ear (Beta) Educational mobile application to improve musical ear https://play.google.com/store/apps/details?id=com.codefive.musicArcade&gl=IT
2017-present	FitWrap Custom fitting package in python available on PIP / github https://www.andreaamico.eu/data-analysis/2018/03/03/fit_wrapper.html
2017-present	Code pills website: https://www.andreaamico.eu/ Collection of tips about machine learning and data analysis using python and jupyter

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Autorizzo il trattamento dei miei dati personali ai sensi del decreto legislativo n° 196 del 30 giugno 2003 “Codice in materia di protezione dei dati personali” e dell’art. 13 GDPR 679/2016 – "Regolamento europeo sulla protezione dei dati personali".

16/06/2021
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