Antonio Norelli

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Education

Ph.D. candidate in Computer Science, 2019-2023, Sapienza University of Rome
- Working on AI and deep learning in the GLADIA research group.
- Advised by prof. Emanuele Rodolà under ERC grant SPECGEO.

MSc in Computer Science, 2016-2018, Sapienza University of Rome (120 ECTS)
- Full scholarship from SSAS — Final grade: 110/110 with honors (GPA 29.5/30)
- Thesis: *Deep Learning for Othello*, advised by Alessandro Panconesi. (We made an AlphaGo Zero for Othello and challenged a former world champion in a public event at the university. More details in my IEEE ToG paper (OLIVAW).)

BSc in Physics, 2013-2016, Sapienza University of Rome (180 ECTS)
- Full scholarship from SSAS — Final grade: 110/110 with honors (GPA 28.9/30)
- Thesis: *Implementation of multivariate analysis techniques in High Energy physics*, advised by Stefano Giagu

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Honors

Excellence degree in Science and Technology, 2013-2018, Sapienza School for Advanced Studies (SSAS) (70 ECTS)

SSAS is a Superior Graduate School in Italy, selecting the best Sapienza freshmen for a parallel interdisciplinary degree with extra courses and mentoring. Renowned foreign and internal academics are involved in the programme *(**Acceptance rate 0.1%**)*.

Research Positions

PhD Researcher, Sapienza University - department of Computer Science, November 2019 - Fall 2023
- Empirical and theoretical investigations on generalization, language grounding, and abstraction.
- Research on artificial scientific discovery with deep learning models.
- Research on generative models in geometric deep learning.

PhD Applied Scientist Intern, Amazon Science - AWS Lablet team in Tübingen, January 2022 - July 2022
- Research on deep learning multimodal models based on analogies rather than contrastive learning.

Software Engineer Intern, Pi School of AI in Rome, April 2019 - June 2019
- Worked on a NLP project provided by ENEL about learning sentence embeddings to cluster IT tickets.

Research Intern, Spiketrap, San Francisco (CA), May 2017 - November 2017
- Developed an unsupervised entity recognizer for gaming product attribution tasks (worked remotely).

Selected Publications and Preprints

Antonio Norelli, Marco Fumero, Valentino Maiorca, Luca Moschella, Emanuele Rodolà, Francesco Locatello. "ASIF: Coupled Data Turns Unimodal Models to Multimodal without Training." (2022) *arXiv*.

Luca Moschella, Valentino Maiorca, Marco Fumero, **Antonio Norelli**, Francesco Locatello, Emanuele Rodolà. "Relative Representations Enable Zero-shot Latent Space Communication" (2022) ***Top-5%*** at the *11th International Conference on Learning Representations (ICLR).*

Antonio Norelli, Giorgio Mariani, Luca Moschella, Andrea Santilli, Giambattista Parascandolo, Simone Melzi, Emanuele Rodolà. "Explanatory Learning: Beyond Empiricism in Neural Networks" (2022) *arXiv.*

Antonio Norelli, Alessandro Panconesi "OLIVAW: Mastering Othello without Human Knowledge, nor a Penny" (2022) *IEEE Transactions on Games.*

Luca Cosmo, **Antonio Norelli**, Oshri Halimi, Ron Kimmel, Emanuele Rodolà. "Limp: Learning latent shape representations with metric preservation priors." (2020) ***Oral*** at the *16th European Conference on Computer Vision (ECCV).*

Other Publications and Preprints

Enrico Lauletta, Beatrice Biancardi, **Antonio Norelli**, Maurizio Mancini, Alessandro Panconesi "Errare humanum est? a pilot study to evaluate the human-likeness of a AI othello playing agent" (2022) *Proceedings of the 22nd ACM International Conference on Intelligent Virtual Agents.*

Aarohi Srivastava, ..., **Antonio Norelli**, et al. "Beyond the Imitation Game: Quantifying and extrapolating the capabilities of language models" (2022) *arXiv.*

Antonio Norelli, Luca Moschella, Simone Melzi, Giorgio Mariani, Marco Fumero, Arianna Rampini, Michele Mancusi, Luca Cosmo, Emanuele Rodolà. "The value of a Rationalist Approach in AI" (2019) *AAAI Fall Symposium on Abstraction and Analogy in AI*

Invited Talks

"ASIF: Coupled Data Turns Unimodal Models to Multimodal Without Training",

- *Autodesk London*, February 16th, 2023
- *Cambridge University, Computer Science Department*, February 15th, 2023
- *Imperial College University, CS Department*, February 14th, 2023

"Saremo assimilati? Meraviglie, trappole e limiti dell'intelligenza artificiale", *Symposium organized by the Italian Order of Journalists*, September 20th, 2022

"From sound to metric priors: new paradigms for shape generation", *Tokyo Institute of Technology*, September 12th, 2022

"Explanatory Learning: scientific theories can be formulated by a machine?", (in italian) *DataScienceSeed*, July 19th, 2022

"How to create an artificial scientist", *Quantum Photonics*, June 9th, 2022

"Umano, troppo umano? Intelligenza Artificiale e disinformazione", *International Symposium Giornalismo e disinformazione at UniPa*, December 17th, 2021

"Towards a human-level artificial intelligence", *Cassini Junior Workshop from French Embassy in Italy and SSAS*, June 6th, 2020

"Learning deformable style transfer via differentiable intrinsic distances", *Technion -*

Israel Institute of Technology, February 26th, 2020

"The italian AlphaZero", (in italian) *Italian Association for Machine Learning*, February 19th, 2019

Teaching Experience

Teaching assistant, two iterations of the *Deep Learning & applied AI* course in the master degree of Computer Science in Sapienza (a.a. 19/20 and 20/21).

- I was responsible for the lab sessions (20 hours), coauthoring 10 tutorials, the written exams, and giving some food for thought during the course.

Thesis coadvisor, Sapienza University

- *A DL approach to solve the Double Dummy problem in Contract Bridge.* MSc thesis in Mathematics of G. D'Amely, 2020
- *Playing Space Invaders with Deep Reinforcement Learning.* BSc thesis in Computer Science of G. Quadraroli, 2020

Service

Reviewer for:

- conferences: NeurIPS, ICLR, ICML, CVPR, ECCV, GMDL
- journals: IEEE Transactions on Games

Student Representative in the PhD board, Computer Science department at Sapienza University, 2021-2023

Skills

Programming languages: Python, Jupyter lover, LaTeX, Matlab, C, C#, Prolog.

ML libraries: Torch, Tensorflow and Keras, numpy, sklearn, pandas, huggingface.

Human languages: Italian, English.