## CV Antonio Norelli

| Education                                 | Ph.D. candidate in Computer Science, 2019-2023, Sapienza University of Rome  |
|---|--|
|   | <ul> <li>Working on AI and deep learning in the GLADIA research group.</li> <li>Advised by prof. Emanuele Rodol a under ERC grant SPECGEO.</li> </ul>  |
|   | MSc in Computer Science, 2016-2018, Sapienza University of Rome (120 ECTS)   |
|   | <ul> <li>Full scholarship from SSAS — Final grade: 110/110 with honors (GPA 29.5/30)</li> <li>Thesis: <i>Deep Learning for Othello</i>, advised by <u>Alessandro Panconesi</u>. (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).)</li> </ul> |
|   | BSc in Physics, 2013-2016, Sapienza University of Rome (180 ECTS)  |
|   | <ul> <li>Full scholarship from SSAS — Final grade: 110/110 with honors (GPA, 28.9/30)</li> <li>Thesis: Implementation of multivariate analysis techniques in High Energy physics, advised by <u>Stefano Giagu</u></li> </ul>   |
| Honors                                    | <b>Excellence degree in Science and Technology,</b> 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 ( <i>Acceptance rate 0.1%</i> ).   |
| Research<br>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.  |
|   | <ul> <li>PhD Applied Scientist Intern, Amazon Science - AWS Lablet team in Tu¨bingen, January 2022 - July 2022</li> <li>Research on deep learning multimodal models based on analogies rather than</li> </ul>  |
|   | contrastive learning.  |
|   | <ul> <li>Software Engineer Intern, Pi School of AI in Rome, April 2019 - June 2019</li> <li>Worked on a NLP project provided by ENEL about learning sentence embeddings to cluster IT tickets.</li> </ul>  |
|   | <ul> <li>Research Intern, Spiketrap, San Francisco (CA), May 2017 - November 2017</li> <li>Developed an unsupervised entity recognizer for gaming product attribution tasks (worked remotely).</li> </ul>  |
| Selected<br>Publications<br>and Preprints | Antonio Norelli, Marco Fumero, Valentino Maiorca, Luca Moschella, Emanuele Rodol`a, Francesco Locatello. "ASIF: Coupled Data Turns Unimodal Models to Multimodal without Training." (2022) <i>arXiv</i> .  |

|  | Luca Moschella, Valentino Maiorca, Marco Fumero, Antonio Norelli, Francesco Locatello, Emanuele Rodol`a. "Relative Representations Enable Zero-shot Latent Space Communication" (2022) <b>Top-5%</b> at the 11th International Conference on Learning Representations (ICLR).   |
|--|---|
|  | <b>Antonio Norelli</b> , Giorgio Mariani, Luca Moschella, Andrea Santilli, Giambattista Parascandolo, Simone Melzi, Emanuele Rodol'a. "Explanatory Learning: Beyond Empiricism in Neural Networks" (2022) <i>arXiv</i> .  |
|  | Antonio Norelli, Alessandro Panconesi "OLIVAW: Mastering Othello without Hu-<br>man Knowledge, nor a Penny" (2022) <i>IEEE Transactions on Games</i> .  |
|  | Luca Cosmo, Antonio Norelli, Oshri Halimi, Ron Kimmel, Emanuele Rodol`a.<br>"Limp: Learning latent shape representations with metric preservation priors." (2020)<br>Oral at the 16th European Conference on Computer Vision (ECCV).  |
| Other<br>Publications<br>and Preprints | Enrico Lauletta, Beatrice Biancardi, <b>Antonio Norelli</b> , Maurizio Mancini, Alessan-<br>dro Panconesi "Errare humanum est? a pilot study to evaluate the human-likeness<br>of a AI othello playing agent" (2022) <i>Proceedings of the 22nd ACM International</i><br><i>Conference on Intelligent Virtual Agents.</i> |
|  | Aarohi Srivastava,, <b>Antonio Norelli</b> , et al. "Beyond the Imitation Game: Quan-<br>tifying and extrapolating the capabilities of language models" (2022) <i>arXiv</i> .   |
|  | <b>Antonio Norelli</b> , Luca Moschella, Simone Melzi, Giorgio Mariani, Marco Fumero,<br>Arianna Rampini, Michele Mancusi, Luca Cosmo, Emanuele Rodol`a. "The value<br>of a Rationalist Approach in AI" (2019) <i>AAAI Fall Symposium on Abstraction and</i><br><i>Analogy in AI</i>                                      |
| Invited Talks                          | <ul> <li>"ASIF: Coupled Data Turns Unimodal Models to Multimodal Without Training",</li> <li>Autodesk London, February 16th, 2023</li> </ul>  |
|  | • 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", Sympo-<br>sium organized by the Italian Order of Journalists, September 20th, 2022  |
|  | "From sound to metric priors: new paradigms for shape generation", <i>Tokyo Institute of Technology</i> , September 12th, 2022  |
|  | "Explanatory Learning: scientific theories can be formulated by a machine?", (in italian) <i>DataScienceSeed</i> , 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<br>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<br>Experience | <ul> <li>Teaching assistant, two iterations of the Deep Learning &amp; applied AI course in the master degree of Computer Science in Sapienza (a.a. 19/20 and 20/21).</li> <li>I was responsible for the lab sessions (20 hours), coauthoring 10 tutorials, the written exams, and giving some food for thought during the course.</li> </ul> |
|                        | <ul> <li>Thesis coadvisor, Sapienza University</li> <li>A DL approach to solve the Double Dummy problem in Contract Bridge. MSc thesis in Mathematics of G. D'Amely, 2020</li> </ul>  |
|                        | • Playing Space Invaders with Deep Reinforcement Learning. BSc thesis in Computer Science of G. Quadraroli, 2020  |
| Service                | Reviewer for:<br>• 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                 | <b>Programming languages</b> : Python, Jupyter lover, LAT X, Matlab, C, C#, Prolog.   |
|                        | ${\bf ML}$ libraries: Torch, Tensorflow and Keras, numpy, sklearn, pandas, hugging<br>face.   |
|                        | Human languages: Italian, English.  |