

Riccardo Renzulli

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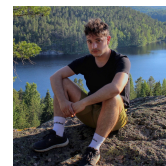
🌐 riccardorenzulli.github.io

🏠 Turin, Italy

in riccardo-renzulli

📄 Riccardo Renzulli

🎂 28/01/1993



Bio

I'm a PostDoc researcher at the University of Turin, Computer Science Department, EIDOS group. My research focuses on artificial intelligence and deep learning, and I am particularly interested in representation learning, interpretability, robustness, multimodal foundation models and medical imaging.

Education

- 11/2019 – 07/2023 ● **Doctoral Degree**, *University of Turin, Computer Science Department, Italy*
Final grade: Passed with Honour
Thesis title: Hierarchical Object-Centric Learning with Capsule Networks
- 09/2015 – 12/2018 ● **Master Degree**, *University of Turin, Computer Science Department, Italy*
Final grade: 110/110 cum laude
Thesis title: An exploratory study into Capsule Networks and how to make them deeper
- 09/2012 – 10/2015 ● **Bachelor Degree**, *University of Turin, Computer Science Department, Italy*
Final grade: 105/110
Thesis title: Non-monotonic extensions of Description Logics and a Protégé Plugin for reasoning about typicality

Work Experience

- 11/2023 – Now ● **PostDoc Researcher**, *University of Turin, Computer Science Department, Italy*
Research focused on representation learning, including concept learning, compositionality, and interpretability
- 03/2022 – 09/2022 ● **Visiting Researcher**, *Aalto University, School of Electrical Engineering, Helsinki, Finland*
Development of a system for non-GNSS visual localization of UAVs, supervised by Prof. Ville Kyrki
- 03/2019 – 09/2019 ● **Machine Learning Engineer**, *Machine Learning Reply, Turin, Italy*
Designing and developing machine learning systems for cloud platforms
- 12/2018 – 02/2019 ● **Deep Learning Scientist**, *Addfor S.p.A., Turin, Italy*
Development of deep learning algorithms for image recognition tasks and writing scientific articles for digital marketing
- 02/2018 – 06/2018 ● **Intern**, *Addfor S.p.A., Turin, Italy*
This internship aimed to discover the advantages and disadvantages of Capsule Networks compared to the traditional Convolutional Networks
- 01/2016 – 10/2017 ● **Scholarship Researcher**, *University of Turin, Computer Science Department, Italy*
Development of a Protégé plugin to non-monotonically reason about defeasible inheritance with exceptions in ontologies

Additional Work Experience

- 11/2017 – 03/2018 ● **Inventory Operator, RGIS (Italy)**
Count of items for different retailers
- 07/2012 – 09/2012 ● **Intern, Jatco Insurance Brokers, Malta**
Master dei Talenti Neodiplomati (Fondazione CRT). General administration, archive management, contract renewal
- 06/2011 – 07/2011 ● **Intern, Archimede Library, Settimo Torinese (TO), Italy**
Customer Support, school activities, book cataloging
- 04/2011 – 05/2011 ● **Intern, Equal Opportunity Office, Turin, Italy**
Assistance at refugee and anti-violence centers

Academic Activities

Teaching

- **Teacher**
Programming Course, Master in Design and Management of Multimedia for Communication, University of Turin
- **Lecturer**
DeepHealth Winter School 2022 (medical imaging master class)
- **Invited Seminar Speaker**
Talks on capsule networks for the Deep Learning course (2019-2020, 2020-2021, 2021-2022), University of Turin, Computer Science Department
- **Laboratory Assistant**
Support to the students of the Operating Systems course (40 hours, 2020-2021), University of Turin, Computer Science Department

Research Projects

- **Co.R.S.A.**
Development of a state-of-the-art AI-based system for diagnosing Covid-19 pneumonia from Chest X-ray (CXR) images for the Covid Radiographic imaging System based on AI (Co.R.S.A.) project
<https://corsa.di.unito.it>
- **DeepHealth**
Segmentation of lung nodules and generation of brain perfusion maps in CT scans for the European project DeepHealth (Deep-Learning and HPC to Boost Biomedical Applications for Health)
<https://deephealth-project.eu>

Events Organization

- **COMETE PhD Workshop**
Member of the organizing committee of the COMETE (COMputer SciEnce DeparTmEnt) PhD Workshop (2022-2024), a full-day event dedicated to PhD students of the Computer Science department at the University of Turin.
- **UNIGHT**
Referee for the EIDOS Lab group participation at the European Researchers' Night in Turin (2024).

Academic Activities (continued)

Conferences Attended

- Publications presented at several conferences, such as DL 2017, ICANN 2021, ICIAP 2022, ICIP 2022, Ital-IA 2023, ECCV 2024.

Reviewing Service

- **Reviewer**
Conferences: ICPR (2020), ICANN (2021-2024), ICIAP (2023), ECML PKDD (2023), IROS (2023), ICRA (2024), AIAI (2024), BMVC (2024), NeurIPS (2024), ICLR (2025)
Workshops: SciForDL (NeurIPS 2024), UniReps (NeurIPS 2024)
Journals: IEEE Multimedia, IEEE Open Journal of Signal Processing, IEEE Transactions on Neural Networks and Learning Systems

Thesis supervision

- **Master's Degree in Computer Science**
Candidate: Enrico Cassano
Thesis: Does pruning affect interpretability in deep neural networks? (2024)
- **Bachelor's Degree in Computer Science**
Candidate: Alberto Aiello
Thesis: Enriching lung nodules segmentation with morphological characteristics prediction (2024)
- **Master's Degree in Computer Science**
Candidate: Miriam Fasciana
Thesis: Towards non-invasive stroke diagnosis: a neural network approach to CT perfusion imaging with subsampling (2023)
- **Master's Degree in Computer Science**
Candidate: Paolo Peretti
Thesis: Capsule Networks for lung nodules segmentation (2022)
- **Bachelor's Degree in Computer Science**
Candidate: Alessandro Grassi
Thesis: Encoding rotation representations of synthetic datasets in quaternions-based deep learning models (2021)
- **Master's Degree in Computer Science**
Candidate: Stefano Berti
Thesis: Lung nodules segmentation from CT scans using deep learning (2021)

Other Activities

- **Courses**
Startup Lab 2024 (zi3T business incubator), Startup Creation Lab 2024 (also known as 2030 Academy, University of Turin), Google Cloud Platform 2019, Photography Course 2017 (Leica Akademie, CAM-ERA, Italian Center of Photography).

Research Publications

Preprints

- 1 C. Patrício, C. A. Barbano, R. Renzulli, *et al.*, "Unsupervised contrastive analysis for salient pattern detection using conditional diffusion models," In review, 2024.
- 2 R. Renzulli, E. Tartaglione, and M. Grangetto, "Capsule networks do not need to model everything," In review, 2024.

- 3 F. D. Sario, R. Renzulli, E. Tartaglione, and M. Grangetto, "Boost your nerf: A model-agnostic mixture of experts framework for high quality and efficient rendering," Accepted at the 18th European Conference on Computer Vision (ECCV), 2024.

Journal Articles

- 1 U. A. Gava, F. D'Agata, E. Tartaglione, *et al.*, "Neural network-derived perfusion maps: A model-free approach to computed tomography perfusion in patients with acute ischemic stroke," *Frontiers in Neuroinformatics*, vol. 17, 2023, ISSN: 1662-5196. [DOI: 10.3389/fninf.2023.852105](https://doi.org/10.3389/fninf.2023.852105).
- 2 J. Kinnari, R. Renzulli, F. Verdoja, and V. Kyrki, "Lsvl: Large-scale season-invariant visual localization for uavs," *Robotics and Autonomous Systems*, vol. 168, p. 104 497, 2023, ISSN: 0921-8890. [DOI: 10.1016/j.robot.2023.104497](https://doi.org/10.1016/j.robot.2023.104497).

Conference Proceedings

- 1 C. A. Barbano, R. Renzulli, D. B. Marco Grosso, M. Busso, and M. Grangetto, "Ai-assisted diagnosis for covid-19 cxr screening: From data collection to clinical validation," in *21st IEEE International Symposium on Biomedical Imaging (ISBI)*, Oct. 2024.
- 2 F. Di Sario, R. Renzulli, E. Tartaglione, and M. Grangetto, "Two is better than one: Achieving high-quality 3d scene modeling with a nerf ensemble," in *Image Analysis and Processing – ICIAP 2023*, G. L. Foresti, A. Fusiello, and E. Hancock, Eds., Cham: Springer Nature Switzerland, 2023, pp. 320–331, ISBN: 978-3-031-43153-1.
- 3 G. Spadaro, R. Renzulli, A. Bragagnolo, *et al.*, "Shannon strikes again! entropy-based pruning in deep neural networks for transfer learning under extreme memory and computation budgets," in *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops*, Oct. 2023, pp. 1518–1522.
- 4 H. A. H. Chaudhry, R. Renzulli, D. Perlo, *et al.*, "Lung nodules segmentation with deephealth toolkit," in *Image Analysis and Processing. ICIAP 2022 Workshops*, P. L. Mazzeo, E. Frontoni, S. Sclaroff, and C. Distanto, Eds., Cham: Springer International Publishing, 2022, pp. 487–497, ISBN: 978-3-031-13321-3.
- 5 H. A. H. Chaudhry, R. Renzulli, D. Perlo, *et al.*, "Unitochest: A lung image dataset for segmentation of cancerous nodules on ct scans," in *Image Analysis and Processing – ICIAP 2022*, S. Sclaroff, C. Distanto, M. Leo, G. M. Farinella, and F. Tombari, Eds., Cham: Springer International Publishing, 2022, pp. 185–196, ISBN: 978-3-031-06427-2. [DOI: 10.1007/978-3-031-06427-2_16](https://doi.org/10.1007/978-3-031-06427-2_16).
- 6 R. Renzulli and M. Grangetto, "Towards efficient capsule networks," in *2022 IEEE International Conference on Image Processing (ICIP)*, Oct. 2022, pp. 2801–2805. [DOI: 10.1109/ICIP46576.2022.9897751](https://doi.org/10.1109/ICIP46576.2022.9897751).
- 7 R. Renzulli, E. Tartaglione, A. Fiandrotti, and M. Grangetto, "Capsule networks with routing annealing," in *Artificial Neural Networks and Machine Learning – ICANN 2021*, I. Farkaš, P. Masulli, S. Otte, and S. Wermter, Eds., Cham: Springer International Publishing, 2021, pp. 529–540, ISBN: 978-3-030-86362-3. [DOI: 10.1007/978-3-030-86362-3_43](https://doi.org/10.1007/978-3-030-86362-3_43).
- 8 L. Giordano, V. Gliozzi, G. L. Pozzato, and R. Renzulli, "An efficient reasoner for description logics of typicality and rational closure," in *Proceedings of the 30th International Workshop on Description Logics*, A. Artale, B. Glimm, and R. Kontchakov, Eds., ser. CEUR Workshop Proceedings, vol. 1879, CEUR-WS.org, 2017.
- 9 L. Giordano, V. Gliozzi, G. L. Pozzato, and R. Renzulli, "RAT-OWL: reasoning with rational closure in description logics of typicality," in *Joint Proceedings of the 18th Italian Conference on Theoretical Computer Science and the 32nd Italian Conference on Computational Logic*, D. D. Monica, A. Murano, S. Rubin, and L. Sauro, Eds., ser. CEUR Workshop Proceedings, vol. 1949, CEUR-WS.org, 2017, pp. 306–320.

Skills

- Languages
 - Italian (Mother tongue) and English (C1)
- Coding
 - Java, PHP, Python, R, SQL, XML/XSL, L^AT_EX, ...
- Frameworks
 - GitHub, Docker, Kubernetes, Pandas, Numpy, Scikit-learn, Scipy, Pytorch, Tensorflow ...
- Databases
 - MySQL, PostgreSQL, HSQL, SQLite
- Web Dev
 - HTML, CSS, JavaScript, Apache Web Server, Tomcat Web Server, Streamlit

Miscellaneous

Hobbies and Interests

- Gardening, Photography, Cinema, Music, Books, Hiking, Saunas and many more!

Driving Licence

- B (Cars)

Turin, October 19, 2024

Ricardo Penzelli