Lorenzo Veronese

Computer Engineer & Bioengineer

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Profile

PhD Candidate at Politecnico di Milano, specializing in Computational Cognitive Neuroscience and Neuro-inspired AI. My research focuses on developing computational models to understand human cognitive functions such as planning (through theory-driven models of hippocampal-prefrontal interactions) and visual perception (via generative neural decoding architectures). Recent publications include enhancements to fMRI-based neural decoding pipelines (more than 95% improvement in computational efficiency) and development of ROI-centric explainability analyses.

Education

2024–Present **PhD, Bioengineering**, *Politecnico di Milano (Milan, Italy)*, Supervisors: Prof. Pietro Cerveri, Dr. Pasquale Anthony Della Rosa, Computational Cognitive Neuroscience for Understanding Human Planning and Perception.

2022–2024 **M.Sc., Computer Science Engineering, Artificial Intelligence**, *Politecnico di Milano (Milan, Italy)*, Thesis: "Visual stimulus reconstruction from BOLD fMRI signal using generative AI", Final grade: 110 *cum laude*/110 (GPA: 29.2).

2019–2022 **B.Sc., Computer Science Engineering**, *Politecnico di Milano (Milan, Italy)*, Final grade: 103/110.

Research Experience

2024–Present **PhD Candidate**, *Politecnico di Milano (Department of Electronics, Information and Bioengineering), collaborating with IRCCS Ospedale San Raffaele (Department of Neuroradiology).*

- Computational cognitive neuroscience: Designing a theory-driven neural model of human planning in the Tower of London neuropsychological task.
- Neuro-AI generative modeling: Designing an explainable two-stage generative decoding pipeline to reconstruct visual perception from fMRI data.

2021–2023 **Student Researcher**, *Politecnico di Milano (Department of Electronics, Information and Bioengineering), NECSTLab.*

- Generative AI for data harmonization: Engineered a CycleGAN-based deep learning framework for the harmonization of histopathological images across microscopes.

2022–2023 **Student Researcher**, *Politecnico di Milano (Department of Electronics, Information and Bioengineering), DEEP-SE Lab.*

- Human-computer interaction in psychotherapy: Modeled the dynamics of psychotherapy conversations using formal modelling and natural language processing.

2021–2022 **Student Researcher**, *Politecnico di Milano (Department of Electronics, Information and Bioengineering), AIRLab.*

• Robotic design and prototyping: Led the mechanical and software design of an assistive robotic device to support individuals with motor disabilities in writing tasks.

Scientific Publications

Journal **Veronese, L.**, Moglia, A., Pecco, N., Della Rosa, P.A., Scifo, P., Mainardi, L., & Cerveri, P. (2025). Optimized AI-based neural decoding from BOLD fMRI signal for analyzing visual and semantic ROIs in the human visual system. *Journal of Neural Engineering*, 22(4). 10.1088/1741-2552/adfbc2.

Della Rosa, P.A., Pecco, N., Calloni, S.F., Canini, M., Oprandi, C., Pavani, D., Grimaldi, G., **Veronese, L.**, Favalli, V., Frontino, G., Gambarini, A., Olivieri, G., Scotti, R., Pontesilli, S., Ogliari, A., Rigamonti, A., Falini, A., Baldoli, C., & Bonfanti, R. (2026). Multimodal MRI Neurodevelopmental Profiling in Type 1 Diabetes: Long-term Effects of MDI vs CSII Treatments. *The Journal of Clinical Endocrinology & Metabolism*. dgag102.

Conference **Veronese, L.**, Pecco, N., Moglia, A., Scifo, P., Castellano, A., Mainardi, L., Della Rosa, P.A., & Cerveri, P. (2026). Visual neural decoding performance on different semantic classes of stimuli. *Associazione Italiana Risonanza Magnetica in Medicina (AIRMM 2026)*. (Oral presentation)

Veronese, L., Pecco, N., Moglia, A., Scifo, P., Castellano, A., Mainardi, L., Della Rosa, P.A., & Cerveri, P. (2025). Evaluating Semantic Brain Regions Contribution to Visual Neural Decoding Performance on Different Classes of Stimuli. *20th conference on Computational Intelligence methods for Bioinformatics and Biostatistics (CIBB 2025)*. (Oral presentation. Extended version in press on Lecture Notes in Bioinformatics)

Veronese, L., Poles, I., D'Arnese, E., Santambrogio, M.D. (2023). Stain Transfer using CycleGAN for Histopathological Images. *IEEE EUROCON 2023-20th International Conference on Smart Technologies*. 10.1109/EUROCON56442.2023.10199027.

Preprint Dettori, F.*, Forasassi, M.*, **Veronese, L.***, Lestingi, L., Scotti, V., & Rossi, M.G. (2026). Do You Understand How I Feel?: Towards Verified Empathy in Therapy Chatbots. *ArXiv*. 10.48550/arXiv.2601.08477. (*Equal contribution)

Teaching

2025 **Teaching Assistant, Neuroengineering**, *Politecnico di Milano*

• Delivered lectures on deep learning architectures and methodologies.

• Supervised student groups in designing and training end-to-end deep learning models for decoding visual categories from fMRI data.

2025 **Teaching Assistant, Fundamentals of Computer Science**, *Politecnico di Milano*

• Led laboratory sessions for undergraduate students, teaching algorithmic thinking and data structures in C programming.

Peer Reviewing

Journal IEEE Transactions on Image Processing; IEEE Transactions on Fuzzy Systems; IEEE Transactions on Cognitive and Developmental Systems.

Conference Cognitive Computational Neuroscience (CCN 2026).

Awards & Honors

2025 Selected by Nova Talent (top 3% talent network).

2022 Scholarship for academic merit — Town of Cucciago & Rubelli S.p.a.

Advanced Training & Summer Schools

2025 **European Course on Advanced Imaging Techniques in Neuroradiology**, *IRCCS Ospedale San Raffaele*, Milan, Italy

2025 **XLIV Annual School of Bioengineering**, *University of Pisa*, Pisa, Italy
Topic: "Unlocking the Mind and Emotions: Cutting-Edge Bioengineering Techniques from Computational Physiology to Clinical Applications"

Skills

Expertise	Computational Cognitive Neuroscience, Artificial Intelligence, Deep Learning, fMRI, Planning
Programming	Python, PyTorch, TensorFlow, MATLAB, Bash
Tools	Git, LaTeX, SPM, FSL
Languages	English (C1; TOEFL iBT score: 5.5/6), Italian (native)

References

Pietro Cerveri	Full Professor — Politecnico di Milano & Università di Pavia pietro.cerveri@unipv.it
Pasquale A. Della Rosa	Leading Researcher — IRCCS Ospedale San Raffaele dellarosa.pasquale@hsr.it

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