Marco Nicolini

Research Scientist
Università degli studi di Milano

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NicoRota-0 (GitHub)
LinkedIn

Experience

•Università degli studi di Milano *February 2024 - Present*
Research Scientist Milan
– Designing, implementing and optimizing Large Language Models (LLMs) within the field of biomolecular engineering.

•IES Abroad *January 2022 - May 2022*
Resident Assistant Milan
– Assisted american students adjusting to Italian culture, worked at the IES Abroad Milan office.

Education

•Università degli studi di Milano, Milan (Italy) *September 2021 - December 2023*
MSc "Computer Science" Final Grade 110L/110
– Title of the final thesis: "Language models for the generation of functionally characterized biomolecules".
– Main courses: Bioinformatics, Web Algorithmics, Architectures for Big Data, Artificial Intelligence, Audio Pattern Recognition, Intelligent Systems For Industry, Information Management.

•Albert-Ludwigs-Universität Freiburg, Freiburg (Germany) *October 2022 - March 2023*
Master Exchange Program In Computer Science Engineer department GPA: 27/30
– Main courses: Information Retrieval, Computer Vision, RNA Bioinformatics.

•Università degli studi di Milano, Milan (Italy) *October 2018 - December 2021*
BSc "Music Information Science" Final Grade: 110/110
– Title of the final thesis: "Audio-based Human Activity Classification using Transfer Learning".
– Main courses: Acoustics and Psychoacoustics, Audio and Signal Processing, Artificial Intelligence for Music, Fundamentals of Sound and Digital Music, Methods and Technologies of Music Publishing.

•Universidad Carlos III de Madrid, Madrid (Spain) *February 2021 - July 2021*
Bachelor Exchange Program In Computer Science Engineer department GPA: 27.5/30
– Main courses: Machine Learning, Computer Networks, Software Development.

Publications

•A transformer-based model to predict micro RNA interactions *IWANN proceedings (In press), 2025*
Developed a model combining embeddings from a foundation model with a feed-forward network to predict specific non-coding RNA interactions
– Demonstrated that sequence-based prediction using embeddings outperforms state-of-art methods on micro RNA interaction tasks.

•Fine-tuning of conditional transformers improves in silico enzyme prediction and generation *CSBJ, 2025*
Proposed a pre-trained model specialization approach on specific protein families
– Shown that fine tuning conditional transformers can enhance the prediction accuracy of the pre-trained models and can generate new potentially functional proteins.

•Gender-aware speech emotion recognition in multiple languages *Springer Nature, 2024*
Proposed a solution for Speech Emotion Recognition in multilingual settings
– Demonstrated that a hierarchical approach that includes prior knowledge of the speaker's gender can improve the overall classification performance.

•A hierarchical approach for multilingual speech emotion recognition *ICPRAM proceedings, 2023*
Proposed a Speech Emotion Recognition algorithm for multilingual audio gender-based classification
– Demonstrated that a gender-based emotion classifier can outperform a general emotion classifier.

•Lightweight audio-based human activity classification using transfer learning *ICPRAM proceedings, 2023*
Developed a Deep Neural Network framework using transfer learning to classify human activities
– Shown that the proposed framework surpasses state-of-art performances while it can be executed on mobile devices.

Technical Skills and research field

Languages: Italian (Mothertongue), English (C1 IELTS certificate obtained in March 2023).
Applications: Microsoft Excel, Word, and PowerPoint. LaTeX, Git, GitHub.
Research Field: Machine Learning, Deep Learning, Bioinformatics, Audio Pattern Recognition.