HAMZA AMRANI

amrani.hamzi@gmail.com ◇ LinkedIn ◇ Website
Google Scholar ◇ GitHub

Multimodal Learning, Generative AI, Brain–Computer Interfaces

PROFILE

Ph.D.-trained machine learning researcher with published work in multimodal representation learning, neural-signal decoding, personalization, and generative sequential modelling. Experience spans brain–computer interfaces, robotics simulation, diffusion models, reinforcement learning, and distributed training.

SELECTED RESEARCH IMPACT

Neural-Signal Decoding & BCI — IEEE JBHI 2024 and IEEE EMBC 2024. Built an end-to-end EEG-to-text framework combining subject-dependent representation learning with BART; evaluated on two public ZuCo datasets with 30 subjects and exceeded listed prior results on BLEU-1, ROUGE-1-F, and BERTScore-F. Developed a portable EEG pipeline for motor-imagery robotic control.
Human Activity Recognition — IJMLC 2025 and ICPR 2021. Published methods for dataset integration, continual learning, and personalized deep models for inertial-sensor activity recognition.

EXPERIENCE

Postdoctoral Researcher Feb 2026 – Present
University of Milan-Bicocca, Intelligent Sensing Lab *Milan, Italy*
- Develop multimodal, self-supervised brain-encoding methods that learn representations across fMRI, EEG, and visual, audio, and text stimuli to predict neural responses.
- Advance representation learning for high-dimensional neural signals and computational vision.

Research Scientist Intern Sept 2024 – Jun 2025
myolab *New York City, NY, United States*
- Built conditional diffusion models for 100+ degree-of-freedom musculoskeletal human motion, conditioned on text and spatial signals; developed an autoregressive variant using prior motion history.
- Used the learned latent prior in reinforcement learning for sim-to-real control with MuJoCo, and developed pretraining, post-training, and guidance methods for motion synthesis.
- Conducted large-scale diffusion-model training on AWS for robotics, simulation, and sim-to-real applications.

Visiting Scholar Jun 2024 – Jun 2025
Carnegie Mellon University, Robotics Institute *Pittsburgh, PA, United States*
- Implemented reinforcement and self-supervised learning approaches for human motion synthesis and control with MyoSuite and MuJoCo musculoskeletal models.
- Developed multimodal sensor-fusion methods for pose estimation from IMU, video, depth, and motion-capture data to improve generated-motion quality.

Ph.D. Candidate Nov 2022 – Feb 2026
University of Milan-Bicocca, Intelligent Sensing Lab *Milan, Italy*
- Developed VAEs and transformer-based models for multimodal sequential data, including open-vocabulary generation, attention mechanisms, and streaming inference.
- Studied brain–computer interfaces for motor imagery and speech decoding, building on earlier work in wearable sensing and personalized human-activity recognition.

Data Scientist Mar 2022 – Apr 2024
ContinuumLab.ai *San Francisco, CA, United States (remote)*
- Conducted ESG business analysis and predictive modelling, then developed LLM fine-tuning, evaluation, and RAG systems for domain-specific generation tasks.
- Built multi-tier agent and digital-persona workflows for real-time customer insights across three Fortune 500 clients.

EDUCATION

Ph.D., Computer Science, University of Milan-Bicocca Feb 2026
Thesis: *Learning Representations from Neural Signals*
M.Sc., Computer Science, University of Milan-Bicocca 2021
Summa cum laude; thesis on model- and data-centric AI for personalization in human-activity recognition.

TECHNICAL SKILLS

Machine Learning: PyTorch, JAX, TensorFlow, Transformers, VAEs, diffusion models, reinforcement learning, self-supervised learning, multimodal learning, LLMs.
Systems: Python, CUDA, AWS, PyTorch DDP, DeepSpeed, Docker, Weights & Biases, Git.