

# Guglielmo Montone

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## Profile Summary

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Senior Machine Learning Researcher with 8+ years of academic research (PhD + postdoc) and 6 years as CTO building deployed AI systems in semiconductor manufacturing. Currently refocusing full-time on modern ML research: embodied AI, vision-language-action (VLA) models, JEPA-style latent prediction architectures, and robotics simulation. Hands-on experience with diffusion models, multimodal learning, representation learning, and algorithmic design.

## Current Research Focus

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- Vision-Language-Action (VLA) models, embodied agents, sensorimotor learning
- JEPA / V-JEPA, masked latent prediction, self-supervised world models
- Multimodal representation learning, imitation learning, sim2real transfer

## Recent Research Projects (2025)

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- **V-JEPA with Action-Conditioned Training** — extended the original V-JEPA implementation by training the architecture on data collected from a drawing agent. Demonstrated that providing the model with representations of the actions used to generate each drawing leads to more robust visual recognition of drawings and their spatial transformations. (Code Repository)
- **Diffusion Model Implementation** — developed a DDPM for 16x16 sprite image generation in PyTorch, using U-Net with residual blocks and conditional embeddings; implemented training and sampling pipelines, including iterative denoising. (Code Repository)
- **Ongoing Work** — implementing a small-scale VLA model (e.g. Evo/VLA) and integrating with robotic simulators (MetaWorld / LIBERO);

## Professional Experience

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### 2018–2025    Co-founder & CTO, Lynceus (Industrial AI for Semiconductors)

- Grew company from 2 to ~20 people; built and led a multidisciplinary ML/software engineering team.
- Defined product vision, ML roadmap, and long-term technical strategy.
- Delivered ML models for wafer-quality prediction achieving up to 30% reduction in metrology sampling.
- Designed an LLM-based troubleshooting assistant enabling 2.5× faster root-cause discovery and 50% faster tool recovery.
- Worked with 8 major semiconductor manufacturing firms; led customer discovery and technical integration.
- Regularly interfaced with investors; responsible for technical narrative and due diligence.

## **2015–2017    Postdoctoral Researcher, Université Paris Descartes**

European Project *Feel Speech* (1.5-year, 150k EUR). PI: J. K. O'Regan.

- Conducted daily state-of-the-art deep learning research, developing a hybrid DNN–HMM phoneme-feature recognizer for real-time speech-to-touch sensory substitution.
- Designed, implemented, and deployed end-to-end recognition pipelines integrated with tactile feedback systems for experimental studies.

## **2013–2015    Postdoctoral Researcher, Université Paris Descartes**

European Project *FEEL* (2.5M EUR). PI: J. K. O'Regan.

- Conducted day-to-day research on advanced machine-learning with emphasis on sensorimotor learning, perceptual grounding, and embodied cognition.
- Developed block-modular deep-learning architectures enabling parameter re-use across tasks, achieving strong transfer performance with substantially reduced training requirements.
- Designed a fully differentiable, hyperdimensional-computing-based visual question answering system integrating knowledge-base construction and reasoning in an end-to-end trainable pipeline.
- Developed a fully unsupervised, model-free camera calibration algorithm inspired by developmental robotics, outperforming existing approaches in simulation.

## **2010–2011    Research Assistant, Università Federico II, Napoli**

- Research in computer vision, feature extraction, and early neural network modelling.

## **Selected Research Achievements**

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### **Embodied AI / Robotics**

- Invented a fully unsupervised, model-free camera calibration algorithm enabling self-calibrating robotic systems; achieved state-of-the-art performance among unsupervised approaches.

### **Transfer Learning**

- Proposed block-modular neural networks, later reused by Google DeepMind in Progressive Neural Networks for reinforcement learning.

### **Speech & Sensory Substitution**

- Developed a real-time hybrid DNN+HMM phoneme recognizer for tactile speech prosthesis experiments.

### **Ecology / Audio Recognition**

- Built a deep learning system for bird-song and environmental-noise classification deployed at Laboratoire Éthologie Cognition Développement (Paris).

## **Education**

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- **Ph.D., Computer Science**, Università Federico II, Napoli (2013)
- **M.Sc., Theoretical Physics**, *Magna cum laude*, Università Federico II (2010)
- **B.Sc., Physics**, *Magna cum laude*, Università Federico II (2006)

## Technical Skills

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- **Machine Learning:** PyTorch, HuggingFace Transformers; diffusion models, transformers
- **Robotics & Simulation:** MetaWorld, LIBERO
- **Programming:** Python (10+ years, primary), C/C++ (5 years, robotics & simulation), Bash (3 years)
- **Data Analysis & Visualization:** NumPy, SciPy, Pandas; Matplotlib, Plotly
- **Tools & Platforms:** GitHub, Docker, MLflow; Linux, Latex
- **Project Management & Collaboration:** Jira, Confluence

## Languages

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- Italian (Native), English (Fluent), French (Fluent), Turkish (Basic)

## Selected Publications

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- Montone, G., O'Regan, J. K., Terekhov, A. V., "Unsupervised model-free camera calibration algorithm for robotic applications," *IROS*, 2015.
- Terekhov, A. V., Montone, G., O'Regan, J. K., "Knowledge transfer in deep block-modular neural networks," *Conference on Biomimetic and Biohybrid Systems*, 2015.
- Montone, G., O'Regan, J. K., Terekhov, A. V., "Block Neural Network Avoids Catastrophic Forgetting When Learning Multiple Task," *Continual Learning and Deep Networks workshop at NeurIPS*, 2016.
- Montone, G., O'Regan, J. K., Terekhov, A. V., "Gradual Tuning: a better way of Fine Tuning the parameters of a Deep Neural Network," *Teaching Machine Humans and Robots workshop at NeurIPS*, 2017.
- Montone, G., O'Regan, J. K., Terekhov, A. V., "Hyper-dimensional computing for a visual question-answering system that is trainable end-to-end," arXiv:1711.10185, 2017.
- Jacquey, L., Montone, G., et al., "Sensitivity to sensorimotor contingencies in infants: a paradigm for robotic/psychology collaboration," Poster, 2017.

Full list: [Google Scholar](#)