# Luigi Sigillo, PhD

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## Summary

Ph.D. in Generative AI with expertise in machine learning, deep learning, and computer vision. Specialized in generative modeling, multimodal learning, and developing robust AI systems. Proven track record in collaborative research environments and leadership in innovative projects.

## Experience

- **Singapore Management University - School of Computing and Information Systems** — Singapore
  *Visiting Researcher* — *Mar – Aug 2025*
  - Conducting research on super-resolution diffusion models with wavelet-based frequency conditioning under the supervision of Prof. Shengfeng He at the Visual Understanding and Generation Lab (VUG).
  - Developing novel techniques to enhance high-resolution image generation by improving the reconstruction of high-frequency details in diffusion models.
- **Sapienza University of Rome** — Rome, Italy
  *Teaching Assistant – MSc in Electronics Engineering* — *Jan – Jun 2024*
  - **Machine Learning for Signal Processing (Fall 2024)**: assisted in lectures, project preparation, creation of new teaching material, and evaluation for data science and machine learning basics.
- **ELMAN Srl** — Pomezia, Italy
  *AI Consultant* — *Jan – Sep 2023*
  - Developed SeaFormer, a state-of-the-art transformer-based model for vessel route forecasting.
  - Forecast position of a vessel with a prediction error after 8 hours which is below 5 nmi and at the same time the SOG error is double times better than the actual state of the art.
  - Published research in machine learning conference proceedings. (MLSP 2023)
- **omninext** — Rome, Italy
  *Machine Learning Engineer (Full Time)* — *Mar – Jun 2022*
  - I worked on deep learning solutions for photovoltaic energy predictions.
  - Collaborated with Regional Italian Authorities
- **Xpeppers/Claranet IT** — Ciampino (RM), Italy
  *Cloud Engineer (Internship)* — *Mar – Jun 2019*
  - Built AWS-based serverless app for monitoring event-driven architectures with real-time error and overload alerts, improving technical response times.
  - Implemented CD/CI pipelines, reducing system downtime by 30% and improving technical response times.
  - Tech stack: AWS services including Lambda, DynamoDB, and CloudWatch; Python; HTML/CSS/Javascript.

## Selected Publications

- **"Latent Wavelet Diffusion For Ultra High-Resolution Image Synthesis"**.
  ***L. Sigillo***, *S. He, D. Comminiello.* — ICLR 2026
- **"Gramian Multimodal Representation Learning and Alignment"**.
  *G. Cicchetti, E. Grassucci,* ***L. Sigillo***, *D. Comminiello.* — ICLR 2025
- **"Metadata, Wavelet, and Time Aware Diffusion Models for Satellite Image Super Resolution"**.
  ***L. Sigillo***, *R. Giamba, D. Comminiello.* — ICLRW 2025
- **"Guess What I Think: Streamlined EEG-to-Image Generation with Latent Diffusion Models"**.
  *E. Lopez*,* ***L. Sigillo****, F. Colonnese, M. Panella, D. Comminiello.* — ICASSP 2025
- **"Generalizing medical image representations via quaternion wavelet networks"**.
  ***L. Sigillo***, *E. Grassucci, A. Uncini, D. Comminiello.* — Neurocomputing 2025
- **"Ship in Sight: Diffusion Models for Ship-Image Super Resolution"**.
  ***L. Sigillo***, *R.F. Gramaccioni, A. Nicolosi, D. Comminiello.* — IJCNN 2024

## Education

- **Ph.D. in Information and Communication Technology (ICT)** — June 2022 – Sep 2025
  *Sapienza University of Rome* — *Rome, Italy*
- **MSc. in Engineering in Computer Science** — Sep 2019 – Jan 2022
  *Sapienza University of Rome* — *Rome, Italy*
- **B. Eng. in Computer Science and Engineering** — Nov 2016 – Jul 2019
  *Roma Tre University* — *Rome, Italy*

## SKILLS

- **Programming**: Python, PyTorch, TensorFlow, Numpy, Java
- **Development**: Docker, Git, SQL, NoSQL, CI/CD, AWS, Linux
- **Soft Skills**: Leadership, Project Management, Scientific Writing, Public Speaking, Time Management

## PROJECTS

- **CartoonGAN**: Testing and Implementation of "CartoonGAN: Generative Adversarial Networks for Photo Cartoonization". github
- **Aviation Crashes Visualization**: D3js to represent information about aircraft crashes such that accidents could be easily plotted, analyzed and understood. github
- **NextRoom**: IoT project meant for Sapienza Smart Museum involving STM low energy boards. The system suggests to visitors the best rooms to visit according to their tastes and during the Covid19 helps to guarantee social distancing and avoid gatherings. github
- **PhilosopherRank**: a PageRank-based method applied on philosophers' Wikipedia pages to extract influence relations and rank objectively the most influential philosophers. github
- **TeamX Mobile App**: Quick and easy way to find collaborators for your projects. Android/iOS App in C# github
- **TeamX Web App**: Spring Boot web app for TeamX with Java back-end and PostgreSQL database github