Giorgio Giannone

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I am broadly interested in Probabilistic Machine Learning, Perception and Geometry, with a focus on **Conditional Generative Models**, **Hierarchical Variational Inference**, **Few-Shot Generation**, **Multitask Language Models**, and **Diffusion Models**.

Education

Visiting PhD Student, MIT School of Engineering — Cambridge, Massachusetts, USA — *Jan 2023 - June 2023*
- Constrained Diffusion Models for Multifidelity Engineering Design
  - Host: Faez Ahmed, DeCoDE Lab

PhD, Statistical Machine Learning — Technical University of Denmark, Lyngby, Denmark — *June 2020 - Dec 2023*
- Few-Shot Generative Models
  - Supervisor: Ole Winther; Co-supervisor: Søren Hauberg

Master's Degree, Data Science — Sapienza University, Rome, Italy — *Sept 2016 - Nov 2018*
- Excellence Path & Summa Cum Laude
- Thesis: Multimodal Learning for Scene Understanding
  - Supervisor: Aris Anagnostopoulos; External Supervisor: Boris Chidlovskii

Visiting Graduate Student, NYU Tandon School of Engineering — NYC, New York, USA — *Sept 2017 - Jan 2018*
- Visualization and Data Analytics Research Center. Host: Enrico Bertini
  - Built an interactive entity retrieval tool to investigate 10M documents

Master's Degree, Mechanical Engineering — Sapienza University, Rome, Italy — *Sept 2014 - Jan 2017*
- Summa Cum Laude
- Thesis: Bubble Dynamics in Turbulent Shear Flows
  - Supervisor: Carlo Massimo Casciola; Co-supervisor: Paolo Gualtieri

Bachelor's Degree, Mechanical Engineering — Sapienza University, Rome, Italy — *Sept 2009 - May 2014*
- Thesis: Rapid Prototyping of Metallic Manufacturing

Experience

Research Scientist (PhD Intern), IBM Research — Zurich, Switzerland — *June 2022 - Nov 2022*
- Accelerated Discovery Team. Hosts: Matteo Manica, Teodoro Laino
  - Open-source library GT4SD for conditional generative models
  - Multitask Language Models for Text and Chemistry

Applied Scientist (PhD Intern), Amazon AI — Cambridge & London, UK — *July 2021 - Oct 2021*
- Alexa Team. Hosts: Yunlong Jiao, Emine Yilmaz
  - Domain Agnostic Subpopulation Generalisation

Research Engineer, NNAISENSE — Lugano, Switzerland — *Jan 2019 - Jan 2020*
- Deep Learning Team. Managers: Christian Osendorfer, Jonathan Masci
  - Structured Latent Variable Models

Machine Learning Engineer, Pi Campus — Rome, Italy — *Oct 2018 - Dec 2018*
- NLP for large scale data-driven early stage investing

Research Intern, Naver Labs Europe — Grenoble, France — *Feb 2018 - Aug 2018*
- Computer Vision Team. Host: Boris Chidlovskii

– Deep Learning for Scene Understanding

Co-Founder, SecretAIry (formerly GAiA) Rome, Italy
July 2017 - Jan 2019

- Chatbots to enhance Workplace Communication
  - Selected among 100+ startups to participate in the EnLabs Incubator

Publications & Patents

Generalizing from Limited Data in Diffusion Models in-submission ICML23
Giannone, Nielsen, Winther *2023*

Unifying Molecular and Textual Representations via Multi-task LM in-submission ICML23
Christofidellis*, Giannone*, Born, Winther, Laino, Manica *2023*

GT4SD: Generative Toolkit for Scientific Discovery under-review, arXiv
GT4SD Team *2022*

Few-Shot Diffusion Models SBM@NeurIPS
Giannone, Nielsen, Winther *2022*

JM1: Worst-group Generalization by Group Interpolation NeurIPS-W
Giannone, Havrylov, Massiah, Yilmaz, Jiao *2022,2021*

SCHA-VAE: Hierarchical Context Aggregation for Few-Shot Generation ICML
Giannone, Winther *2022*

Method and apparatus for semantic segmentation and depth completion US Patent
Chidlovskii, Giannone *2022*

Hierarchical Few-Shot Generative Models NeurIPS-W
Giannone, Winther *2021*

Transformation-aware Variational Autoencoders tech report
Giannone, Saremi, Masci, Osendorfer *2020*

Input-filtering NeuralODEs for spiking data NeurIPS-W
Giannone, Anoosheh, Quaglino, D'Oro, Masci, Gallieri *2020*

$\mathcal{T}$-VAE: No Representation without Transformation NeurIPS-W
Giannone, Masci, Osendorfer *2019*

Learning Common Representation from RGB and Depth Images CVPR-W
Giannone, Chidlovskii *2019*

Open-source

GT4SD: Generative Toolkit for Scientific Discovery 2022

– Library leveraging conditional generative models for accelerated discovery.

– I worked on: Diffusion Models for images and 3D molecule conformation. The GFlowNet framework. A Property Prediction module. Public Hub for model upload. Training Pipelines. Documentation. Tutorials. Testing. CI/CD. Server and Client API. Docker Images for CPU and GPU.

Grants & Awards

Grant, Otto Møensted's Foundation Copenhagen, Denmark
Grant research abroad *Dec 2022*

Grant, Independent Research Fund Denmark Lyngby, Denmark
DFF PhD Grant *Jun 2020*

Grant, Perception as Generative Reasoning Workshop NeurIPS 2019
Free conference registration *Oct 2019*

Grant, Pi School — Rome, Italy
Full tuition covered for the School of AI (3% acceptance rate) — *Oct 2018*

Certificate of Award, Tsinghua University — Beijing, China
Prize for outstanding accomplishments (top 6) — *Aug 2018*

Certificate of Achievement, Naver Labs Europe — Grenoble, France
Prize for the best internship performance — *Jul 2018*

1st Pick, Excellence Path, Master's Degree, Data Science — Rome, Italy
Admission based on the first year's academic performance — *Mar 2018*
Participation in activities at the School for Advanced Studies

1st Place, Global AI Hackathon, Italian Edition — Rome, Italy
Our team built GAiA, a working assistant chatbot — *Jun 2017*
We won three prizes: Challenge Microsoft, People's Choice, Product Market Fit

Academic Service

Reviewer

Conference: ICML21 (top 10%), AISTATS21, ICML22, NeurIPS22, CVPR2023

Conference (assisted review): ICML19, ICCV19, AAAI20

Journal: TPAMI

Workshop: NeurIPS-IBW20, NeurIPS-MetaLearn21

Teaching

Teaching: TA for Deep Learning (02456), Bayesian Machine Learning (02477), Advanced Machine Learning (02460)

Supervision: two special courses (9 months), one master's thesis (6 months), 18 course final projects

Volunteering

PAISS18, NeurIPS18, ELLIS Unit Copenhagen MLLS

Skills

Languages

- Python (proficient); R, Matlab (good knowledge); C, Java, JavaScript (basic knowledge)

Research

- HuggingFace, LaTeX, NLTK, OpenCV, PyTorch, TensorFlow

Software

- AWS, CVX, Docker/podman, FastAPI, Git, GitHub Actions, Linux, MinIO, MongoDB, MySQL, Travis

Miscellaneous

Summer/Winther Schools

- OxML22 , ProbAI21, M2L21, SMILES20, EEML20, RegML20, ETH School on PDEs, Tsinghua DL 2018, PAISS18

Talks

- Algorithmic Methods for Data Mining (Sapienza University), Bayesian Reading Group (DTU), MLLS Center (KU), UCL-NLP (London), Amazon Alexa (Cambridge), DeCoDE Lab (MIT)

Online Education

- Coursera: Machine Learning (Oct 2016), Deep Learning (Aug 2017).
- edX:

  Computer Science (Nov 2016), Artificial Intelligence (Apr 2017), CS50 (Jan 2021), Math for Quant Finance (Oct 2021), Causal Diagrams (Nov 2021), Science and Business of Biotech (Jun 2022).
- Udacity: Self-Driving Cars Nanodegree, 1st term (Dec 2017).

Associations

- Italian Association for Machine Learning (IAML);
- ContinualAI