

# Gianluca Scarpellini

<https://scarpellini.dev> | [gianluca@scarpellini.dev](mailto:gianluca@scarpellini.dev)

## EDUCATION

### ITALIAN INSTITUTE OF TECHNOLOGY

#### PHD IN COMPUTER SCIENCE

Present | Genoa, Italy

### UNIVERSITY OF MILANO-BICOCCA


#### MS IN COMPUTER SCIENCE


Oct 2020 | Milan, Italy

#### BS IN COMPUTER SCIENCE

Jul 2018 | Milan, Italy

## LINKS

 [gianscarpe](#)

 [gianlucascarpellini](#)

## COURSEWORK

### UNIVERSITY

Advanced Machine Learning

Computer Vision

Robotics

Probabilistic models

Machine Learning

### ONLINE COURSES

AGI Safety Fundamentals [[BlueDot](#)]

Deep Reinforcement Learning [[GitHub](#)]

Probabilistic Machine Learning (Coursera)

### SUMMER SCHOOLS

Probabilistic AI Summer School 2022

Eastern European Summer School 2021

Mediterranean Summer School 2021

## SKILLS

### PROGRAMMING LANGUAGES

Python • C++ • Node.js • C# • Matlab

Proficiency with:

Opencv • Pytorch • Pytorch-lightning

Jax • Haiku • Beam • Habitat

## ABOUT ME

- Ph.D. student and former intern at **DeepMind** with experience in leading projects on Computer Vision and Reinforcement Learning with 4 published papers, 2 papers under review, and one patent application;
- Excellent communication, cross-discipline collaboration, and leadership skills acquired through academic research, internships, and open-source contributions.
- Significant contributions to the open-source community of **PyTorch Lightning** with 4 merged PRs and 1,000 lines of code.

## EXPERIENCE

### DEEPMIND | RESEARCH ENGINEER INTERNSHIP

Sep 2022 - Jan 2023 | Robotics Team, London, UK

- Developed  *$\pi 2vec$* , an approach leveraging foundation models for offline policy evaluation [1];
- Achieved an enhancement in policy evaluation efficiency, with performance gains of up to 10x observed on both real-world and simulated robotic platforms;
- **Paper** accepted at ICLR 2024 and under review for **patenting**.

### ITALIAN INSTITUTE OF TECHNOLOGY | PH.D. STUDENT

Mar 2020 – Present | Genova, Italy

- Strong mathematical skills with expertise in Bayesian inference and generative AI, utilized in my novel **Diffusion Models** formulation that achieves state-of-the-art results on ordering text, 3D object reassembly, and outperforms long-lasting optimization methods for solving puzzles [2,3] [[Github](#)] (accepted at CVPR2024);
- Extended Geometrical GNN-based solutions for Machine Learning Potentials and Force Fields through a collaboration with Dompé pharmaceuticals;
- Extensive knowledge and experience in Reinforcement Learning (RL), as demonstrated by delivering a pipeline that leverages **curiosity-driven exploration** to improve a robot **object-detector** by 13% in challenging photorealistic scenarios (Habitat) and on real robots without any human interventions [4];
- Demonstrated ability to navigate technical complexity and ambiguity, as evidenced by successfully developing deep technical expertise in human pose estimation and person re-identification with event cameras [5,6];
- Mentored 2 **master students** working on Diffusion Models.

### PYTORCH LIGHTNING | OPEN SOURCE CONTRIBUTIONS

Sep 2020 - Present

- Implemented an instance segmentation metric for Pytorch Lightning - Torchmetrics [PR], refined multi-gpu utilities [PR], and refactored tests for single and multi-GPUs [PR]
- Reviewed internal design choices [PR]

### ARGO VISION | RESEARCH ENGINEER

May 2019 - Jan 2020 | Milan, Italy

- Directed a project on **aerial semantic segmentation** through deep learning, achieving IOU > 80% through hyperparameters optimization;
- Engineered and delivered models for **car model and maker classification** (200 classes) with accuracy > 80% (Keras), and **plate detection & OCR** pipeline and optimized it with quantization for deployment on Raspberry Pis (Tensorflow);



# PUBLICATIONS

[1] Gianluca Scarpellini, Ksenia Konyushkova, Claudio Fantacci, Thomas Paine, Yutian Chen, and Misha Denil.

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$\pi 2vec$  : Policy representation with successor features. In *The Twelfth International Conference on Learning Representations*

- [2] Gianluca Scarpellini, Francesco Giuliari, Stuart James, Yiming Wang, and Alessio Del Bue. Positional diffusion: Ordering unordered sets with diffusion probabilistic models. Under review, 2023.
- [3] Gianluca Scarpellini, Francesco Giuliari, Pietro Morerio Stefano Fiorini, and Alessio Del Bue. Diffassemble: A unified graph-diffusion model for 2d and 3d reassembly. CVPR2024.
- [4] Gianluca Scarpellini, Stefano Rosa, Pietro Morerio, Lorenzo Natale, and Alessio Del Bue. Look around and learn: self-training object detection by exploration. *arXiv preprint arXiv:2302.03566*, 2023. Under review.
- [5] Gianluca Scarpellini, Pietro Morerio, and Alessio Del Bue. Lifting monocular events to 3d human poses. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 1358–1368, June 2021.
- [6] Shafiq Ahmad, Gianluca Scarpellini, Pietro Morerio, and Alessio Del Bue. Event-driven re-id: A new benchmark and method towards privacy-preserving person re-identification. In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, pages 459–468, 2022.
- [7] Gianluca Scarpellini, Ksenia Konyushkova, Claudio Fantacci, Tom Le Paine, Yutian Chen, and Misha Denil.  $\pi 2vec$ : Policy representations with successor features. ICLR2024.