Irene Tallini

Summary

I'm a computer Science PhD student at Sapienza University, working under the superivison of Prof. Emanuele Rodolà in GLADIA Lab.

Education

Technion - Israel Institute of Technology Haifa
Visiting PhD Student. 1 March. 2023 - 31 August 2023

- PhD Advisor: Prof. Alex Bronstein.
- Research topic: **vector quantile regression**, an optimal transport based generative model.

Sapienza University of Rome Rome
PhD Student. Nov. 2020 - May 2024

- PhD Advisor: Prof. Emanuele Rodolà.
- Research interests: From Nov. 2021 I started working under the supervision of prof. Rodolà. In particular, I'm currently working on **deep learning** for **music generation and separation**. I also worked on diffusion models for graph generation. Before that, I did research in the quite different field of underwater internet of things, in the Sapienza Senses Lab., where I worked on autonomos underwater vehicle localization.

Sapienza University of Rome Rome
M.S. in Computer Science Sep. 2017–Jan. 2020

- Thesis Advisor: Prof. Emanuele Rodolà
- Thesis title: "Hamiltonian Spectrum Alignment and Applications to Partial Functional Correspondence"
- Thesis Summary: The thesis is in the field of **geometry processing**. It presents a method for localizing a region of a 3D shape or reconstructing 2D shapes, exploiting only the information contained in the **laplacian spectrum** of the shapes. The method is then used to simplify a pipeline for finding **partial correspondences** between a shape and a region of it.
- Final Mark: 110/110 with honors

Sapienza University of Rome Rome
B.S. in Mathematics Sep. 2013–Jul. 2017

- Thesis Advisors: Prof. Flavio Chierichetti and Prof. Alessandro Panconesi
- Thesis title: "Probabilistic Algorithms for Dimensionality Reduction in Euclidean Spaces"
- Thesis Summary: This thesis is in the field of Algorithmics and deals with the problem of mapping a set of points in a multidimesional euclidean space into an euclidean space of smaller dimension. In order to solve this **dimensionality reduction** problem, the thesis exposes the well known random projection algorithm, based on **Johnson-Lindenstrauss lemma**. It then introduces a generalization of the latter and gives some estimates of its probability of success.
- Final Mark: 110/110

Publications

[1] G. Mariani, **I. Tallini**, E. Postolache, M. Mancusi, L. Cosmo, and E. Rodolà, *Multi-source diffusion models for simultaneous music generation and separation*, 2023. arXiv: 2302.02257.

[2] M. Pegoraro, S. Vedula, A. A. Rosenberg, **I. Tallini**, E. Rodolà, and A. M. Bronstein, *Vector quantile regression on manifolds*, 2023. arXiv: 2307.01037 [stat.ME].

[3] S. Vedula, **I. Tallini**, A. A. Rosenberg, M. Pegoraro, E. Rodolà, Y. Romano, and A. M. Bronstein, *Continuous vector quantile regression*, 2023.

[4] **I. Tallini**, L. Iezzi, P. Gjanci, C. Petrioli, and S. Basagni, "Localizing autonomous underwater vehicles: Experimental evaluation of a long baseline method", in *Proceedings of IEEE WCNEE 2021*, IEEE, 2021, pp. 443–450.

[5] A. Rampini, **I. Tallini**, M. Ovsjanikov, A. M. Bronstein, and E. Rodolà, "Correspondence-free region localization for partial shape similarity via hamiltonian spectrum alignment", in *2019 International Conference on 3D Vision, 3DV 2019, Québec City, QC, Canada, September 16-19, 2019*, IEEE, 2019, pp. 37–46.

Scholarships and Awards

- **Bando Mobilità Internazionale PhD 2022** Mar. - Jul. 2023
  Sapienza scholarship for international visiting periods.
- **3 year PhD Scholarship** Nov. 2020 - Jan. 2024
  Funded by the Italian Ministry of Education, University and Research.
- **Best Paper Award Runner Up** for paper [4]. Jul. 2021
  Workshop: IEEE Workshop on Wireless Communications and Networking in Extreme Environments (WCNEE 2021)
  Main conference: Distributed Computing in Sensor System (DCOSS 2021)
- **Best Paper Award** for paper [5]. Sep. 2019
  Conference: International Conference on 3D Vision (3DV)
- **Best Paper Award** for paper [5] Sep. 2019
  Workshop: IEEE Women in Engineering (WIE)
  Main conference: International Conference on 3D Vision (3DV)

Summer Schools

- **4th International Summer School of Artificial Intelligence and Games** 29 Aug. - 2 Sep. 2022
  Summer school dedicated to artificial intelligence (AI) techniques in and for games
- **London Geometry and Machine Learning (LOGML 2022)** 11 - 15 Jul. 2022
  Mentor: Georgior Arvanitidis, Project: Differential geometry for representation learning
- **Challenges in building Billion User Cloud Applications" (BUCA 2022)** 19 - 24 Jun. 2022
  Instructors: Dan Ardelean (Distinguished Software Engineer in Google Cloud), Amer Diwan (Distinguished Software Engineer at Google), and JJ Furman (founder and creator of Megastore, the system behind Gmail and Drive).

Teaching

- **Lessons on Network Simulations** at Sapienza University of Rome Apr. 2021
  Internet of Things course for the Computer Science Master's Degree
- **Tutor of C Programming Language** at Sapienza University of Rome Jan. 2019 - Jul. 2019
  Computer Science course for the Mathematics Bachelor's Degree

Work Experience

- **WSENSE Srl.** Jul. 2020 - Oct. 2020
  Underwater Internet of Things Researcher

- **Sapienza University of Rome** Feb. 2020 - Jul. 2020
  Underwater Internet of Things Researcher at SENSES Lab, Computer Science Dept.

Programming Languages and Tools

- **Programming Languages:** Python, Matlab, C++, Java
- **Machine Learning Libraries:** Pytorch, Pytorch Lightning, Pytorch Geometric, Tensorflow
- **Miscellaneous:** Hydra, Wandb, Git, Github/Gitlab, LaTex, Linux, Bash, Windows, Arduino, ROS, ns3.