Filippo Maggioli, Ph.D.

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Short Bio

Research profile

I am a Postdoctoral Researcher at *University of Milano-Bicocca*, where I am a member of the *DIG AIR* research lab led by Simone Melzi. Previously, I was a Postdoctoral Researcher at *Sapienza – University of Rome* in the *GLADIA* research lab led by Emanuele Rodolá, and a Research Intern at the *King Abdullah University of Science and Technology (KAUST)* in the *VCC* research lab led by Peter Wonka. I received my Ph.D. in Computer Science at *Sapienza – University of Rome* (2023), where I also graduated in Computer Science (2019).
I work on geometry processing, spectral geometry, and 3D shape analysis, but I am an active researcher also in other fields of computer graphics, such as procedural shading and physical simulation.
I regularly serve in the program committee of international conferences as chair and reviewer, and I maintain worldwide collaborations with researchers from other institutions and countries.

Research interests

Geometry Processing; Spectral Geometry; 3D Shape Analysis; Procedural Texturing; Simulation of Natural Phenomena; Numerical Linear Algebra.

Author profiles

ORCID: 0000-0001-8008-8468
Google Scholar ID: VN1fbwUAAAAJ — *h*-index: 6 — *i10*-index: 3
Scopus Author ID: 57216313662 — *h*-index: 4 — *i10*-index: 1

Academic Appointments

Mar 2025 – Present
Assistant professor - tenure track. Pegaso University
Department of Computer Science and Information Technologies.

Dec 2023 – Feb 2025
Postdoctoral researcher. University of Milano-Bicocca
Member of the *DIG AIR* research lab.
Advisor: prof. Simone Melzi.
Research activity on computational and spectral geometry.

Apr 2024 – Feb 2025
Adjunct professor. Pegaso University
Undergrad courses on *Computer Achitecture* and *Networking and Cybersecurity*.
Supervision of BSc students during the development of their theses.

Aug 2023 – Nov 2023
Postdoctoral researcher. Sapienza – University of Rome
Member of the *Gladia* research lab.
Advisor: prof. Emanuele Rodolà.
Research activity on computational geometry, spectral geometry, and numerical linear algebra.

Sep 2022 – Jan 2023
Research internship. King Abdullah University of Science and Technology
Member of the *VCC* research lab.
Advisor: prof. Dominik L. Michels.
Research activity on simulation of natural phenomena in agricultural settings.

Mar 2021 – Jul 2021
Teaching assistant. Sapienza – University of Rome
Undergrad course on *Introduction to Algorithms*.

Education

2019 – 2023 **Ph.D. in Computer Science.** Sapienza – University of Rome.
Advisor: prof. Emanuele Rodolà.
Thesis title: *Scalable geometry processing for computer graphics applications.*
Honourable mention at EG-Italy Award for PhD Thesis in Computer Graphics.

2018 – 2019 **M.Sc. in Computer Science.** Sapienza – University of Rome.
Advisor: prof. Emanuele Rodolà.
Thesis title: *Time-efficient function reconstruction via Laplacian eigenproducts.*

2014 – 2017 **B.Sc. in Computer Science.** Sapienza – University of Rome.
Advisor: prof. Enrico Tronci.
Thesis title: *Modeling of biological pathways with systems of differential-algebraic equations.*

Courses and Schools

Jul 2022 **IRDTA DeepLearn 2022 Summer.**
6th International Gran Canaria School on Deep Learning. *Las Palmas de Gran Canaria, Spain.*

Jul 2021 **ACDL 2021.**
Advanced Online & Onsite Course on Data Science & Machine Learning. *Pontignano, Italy.*

Academic Service

2025 **Poster chair.** STAG
Smart Tools and Applications in Graphics. *Genova, Italy*

Member of program committee. ECAI
European Conference on Artificial Intelligence. *Bologna, Italy*

2023 **Member of program committee.** TAG-ML
ICML's workshop on Topology, Algebra, and Geometry in Machine Learning. *Honululu, Hawaii*

2022 **Member of RCDC Conference Coffee Committee.** ACM SIGGRAPH RCDC
ACM SIGGRAPH Research Career Development Committee. *Vancouver, Canada*

2021 **Event chair.** STAG
Smart Tools and Applications in Graphics. *Rome, Italy*

Teaching

2025 **Functional Maps: a spectral approach to the alignment of embeddings**
Ph.D. course. *Sapienza – University of Rome*

Digital Skills for Teaching
Teaching qualification training course. *Pegaso University*

Teaching Networking
Teaching qualification training course. *Pegaso University*

2024 **Networking and Cybersecurity**
Adjunct professor. Undergrad course. *Pegaso University*

Computer Architecture
Adjunct professor. Undergrad course. *Pegaso University*

2021 **Introduction to Algorithms**
Teaching assistant. Undergrad course. *Sapienza – University of Rome*

Invited, Conference, and Seminars Talks

Jun 2025 — **Volumetric Functional Maps**
Sapienza – University of Rome, hosted by *E. Rodolà*. *Rome, Italy*.

Nov 2024 — **Scalable geometry processing in computer graphics applications**
Smart Tools and Applications in Graphics, 2024. *Verona, Italy*

TACO: a benchmark for connectivity-invariance in shape correspondence
Smart Tools and Applications in Graphics, 2024. *Verona, Italy*

Efficient Generation of Multimodal Fluid Simulation Data
Smart Tools and Applications in Graphics, 2024. *Verona, Italy*

Dec 2023 — **A physically-inspired approach to the simulation of plant wilting**
ACM SIGGRAPH Asia, 2023. *Sydney, Australia*.

Oct 2022 — **MoMaS: mold manifold simulation for real-time procedural texturing**
Pacific Graphics (PG), 2022. *Kyoto, Japan*.

May 2022 — **Strassen's algorithm in practice**
Sapienza – University of Rome, hosted by *R. Marin*. *Rome, Italy*.

Aug 2021 — **Efficiently parallelizable Strassen-based multiplication of a matrix by its transpose**
International Conference on Parallel Processing (ICPP), 2021. *Chicago, Illinois, USA*.

May 2021 — **Orthogonalized Fourier polynomials for signal approximation and transfer**
EUROGRAPHICS (EG), 2021. *Vienna, Austria*.

Honours & Awards

2024 — **Matteo Dellepiane Award for PhD Thesis in Computer Graphics (Honourable mention)**
The Italian Chapter of EuroGraphics (EG-Italy).

Research Grants and Funding

2022 — **Sapienza Research Starting Grant: Avvio alla Ricerca – Tipo 2**
Principal investigator for the project *Enhancing Procedural Computer Graphics in Multimedia Applications with Fast Geometry Processing Techniques*.

2021 — **Sapienza Research Starting Grant: Avvio alla Ricerca – Tipo 1**
Principal investigator for the project *Automation of Casting Mold Design for Industrial Fabrication of Digital Objects*.

2020 — **Sapienza Research Starting Grant: Avvio alla Ricerca – Tipo 1**
Principal investigator for the project *GPU Fluid Simulation on Non-Euclidean Domains and Application for Simulation of Erosion Phenomena*.

Reviewing Service

2025 — **GCA.** IEEE Computer Graphics and Applications.
ICCV. International Conference on Computer Vision.
CVPR. IEEE/CVF Conference on Computer Vision and Pattern Recognition.
TPAMI. Transactions on Pattern Analysis and Machine Intelligence.
CAVW. Computer Animation & Virtual Worlds.
EUROGRAPHICS. Annual Conference of the European Association for Computer Graphics.

2024 — **ToG.** ACM Transaction on Graphics.
ACCV. Asian Conference on Computer Vision.

Reviewing Service (continued)

- **Pacific Graphics.** Pacific Conference on Computer Graphics and Applications.
- **ECCV.** European Conference on Computer Vision.
- **EUROGRAPHICS.** Annual Conference of the European Association for Computer Graphics.
- **CGF.** Computer Graphics Forum.
- **TVCG.** IEEE Transactions on Visualization and Computer Graphics.

2023
- **Pacific Graphics.** Pacific Conference on Computer Graphics and Applications.
- **TAG-ML.** ICML's workshop on Topology, Algebra, and Geometry in Machine Learning.
- **ICCV.** International Conference on Computer Vision.
- **NeurReps.** NeurIPS' workshop on Symmetry and Geometry in Neural Representations.
- **ICIAP.** International Conference on Image Analysis and Processing.

2022
- **EUROGRAPHICS.** Annual Conference of the European Association for Computer Graphics.

Supervision and Mentoring

Ph.D.
- Giulio Viganó (University of Milano-Bicocca) – Internal supervisor (not formal advisor)
  Francesca Maccarone (University of Milano-Bicocca) – Internal supervisor (not formal advisor)
  Daniele Baieri (Sapienza – University of Rome) – Internal supervisor (not formal advisor)
  Francesco De Canio (Sapienza – University of Rome) – Internal supervisor (not formal advisor)

M.Sc.
- Giorgio Longari (University of Milano-Bicocca) – Internal supervisor (not formal advisor)
  Roberta Giorgi (Sapienza – University of Rome) – Internal supervisor (not formal advisor)

B.Sc.
- Simone Pedico (University of Milano-Bicocca) – Thesis co-advisor
  Alessio Tosato (University of Milano-Bicocca) – Thesis co-advisor
  Alireza Alipanah (Sharif University of Technology) – Internal supervisor (not formal advisor)
  Daniele Solombrino (Sapienza – University of Rome) – Internal supervisor (not formal advisor)
  Thesis advisor of 11 students in Computer Science (Pegaso University)

Skills

Languages
- Italian (mother tongue), English (professional proficiency).

Interpersonal
- Adaptability to work independently and with(in) a team. Capability of supervising and communicating efficaciously. Excellent organizational and teaching abilities.

Programming
- Proficient in C/C++ and MATLAB. Advanced knowledge of GPU programming with CUDA, GLSL, and HLSL. Knowledge of Python and C#.

Tools
- Expert with the mesh processing software *MeshLab* and the rendering engine *Blender*. Advanced knowledge of the game engines *Unreal Engine 4 and 5* and *Unity 3D*. Familiar with software for raster (*GIMP*) and vector (*InkScape*) 2D graphics.

Research Publications

Journal Articles

1. D. Marin, **F. Maggioli**, S. Melzi, S. Ohrhallinger, and M. Wimmer, "Reconstructing curves from sparse samples on riemannian manifolds," *Computer Graphics Forum*, vol. 43, no. 5, e15136, 2024.
2. **F. Maggioli**, R. Marin, S. Melzi, and E. Rodolà, "Momas: Mold manifold simulation for real-time procedural texturing," *Computer Graphics Forum*, vol. 41, no. 7, pp. 519–527, 2022.
3. L. Moschella, S. Melzi, L. Cosmo, **F. Maggioli**, O. Litany, M. Ovsjanikov, L. Guibas, and E. Rodolà, "Learning spectral unions of partial deformable 3d shapes," *Computer Graphics Forum*, vol. 41, no. 2, pp. 407–417, 2022.

4. **F. Maggioli**, S. Melzi, M. Ovsjanikov, M. M. Bronstein, and E. Rodolà, "Orthogonalized fourier polynomials for signal approximation and transfer," *Computer Graphics Forum*, vol. 40, no. 2, pp. 435–447, 2021.
5. **F. Maggioli**, T. Mancini, and E. Tronci, "Sbml2modelica: Integrating biochemical models within open-standard simulation ecosystems," *Bioinformatics*, vol. 36, no. 7, pp. 2165–2172, 2020.

Conference Proceedings

1. D. Baieri, D. Crisostomi, S. Esposito, **F. Maggioli**, and E. Rodolà, "Efficient generation of multimodal fluid simulation data," in *Smart Tools and Applications in Graphics-Eurographics Italian Chapter Conference*, 2024.
2. F. Maccarone, G. Longari, G. Viganò, D. Peruzzo, **F. Maggioli**, and S. Melzi, "S4a: Scalable spectral statistical shape analysis," in *Smart Tools and Applications in Graphics-Eurographics Italian Chapter Conference*, 2024.
3. **F. Maggioli**, D. Baieri, E. Rodolà, and S. Melzi, "Rematching: Low-resolution representations for scalable shape correspondence," in *European Conference on Computer Vision*, Springer, 2024.
4. S. Pedico, S. Melzi, and **F. Maggioli**, "Taco: A benchmark for connectivity-invariance in shape correspondence," in *Smart Tools and Applications in Graphics-Eurographics Italian Chapter Conference*, 2024.
5. **F. Maggioli**, J. Klein, T. Hädrich, E. Rodolà, W. Pałubicki, S. Pirk, and D. L. Michels, "A physically-inspired approach to the simulation of plant wilting," in *SIGGRAPH Asia 2023 Conference Papers*, 2023, pp. 1–8.
6. **F. Maggioli**, D. Baieri, S. Melzi, and E. Rodolà, "Newton's fractals on surfaces via bicomplex algebra," in *ACM SIGGRAPH 2022 Posters*, 2022, pp. 1–2.
7. V. Arrigoni, **F. Maggioli**, A. Massini, and E. Rodolà, "Efficiently parallelizable strassen-based multiplication of a matrix by its transpose," in *Proceedings of the 50th International Conference on Parallel Processing*, 2021, pp. 1–12.

Pre-prints

1. **F. Maggioli**, M. Livesu, and S. Melzi, "Volumetric functional maps," arXiv preprint arXiv:2506.13212, 2025.
2. D. Baieri, **F. Maggioli**, Z. Lähner, S. Melzi, and E. Rodolà, "Implicit-arap: Efficient handle-guided deformation of high-resolution meshes and neural fields via local patch meshing," arXiv preprint arXiv:2405.12895, 2024.
3. **F. Maggioli**, D. Baieri, Z. Lähner, and S. Melzi, "Sshade: A framework for scalable shape deformation via local representations," arXiv preprint arXiv:2409.17961, 2024.
4. D. Baieri, S. Esposito, **F. Maggioli**, and E. Rodolà, "Fluid dynamics network: Topology-agnostic 4d reconstruction via fluid dynamics priors," arXiv preprint arXiv:2303.09871, 2023.