

PAOLO VIVIANI

PhD – Senior Researcher

Torino, ITALY @ paolo.vivi@gmail.com paoloviviani.github.io



EDUCATION

Ph.D., Computer Science
University of Torino
2015 – 2019 Torino, IT
Thesis: *Deep Learning at Scale with Nearest Neighbours Communications*.
Supervisor: Marco Aldinucci. Funded by Noesis Solutions.

Master’s Degree, Theoretical physics
University of Torino, 104/110
2015 Collegio Universitario “R. Einaudi”, Torino
Scholarship winner: “Piano Lauree Scientifiche 2008”, granted by Società Italiana di Fisica.

EXPERIENCE

LINKS Foundation
Senior Researcher, Advanced Computing
2021 – present Torino, IT

- HPC, Machine Learning and Big Data convergence – acceleration of scientific/technical applications
- Quantum algorithms and applications – discrete optimization on neutral atoms machines and quantum annealers
- ML/DL algorithms for neural signal decoding
- Funded research projects – proposals writing, technical management and execution
- ETP4HPC Working groups member

Noesis Solutions
Research Engineer
2015 – 2021 Novara, IT

- Machine learning methodologies for engineering modelling and design exploration
- Development of numerical code and software stack
- Supervisor of one internship
- Technical contact for funded research projects

Funded Research Projects		
See paoloviviani.github.io/projects for full list and details.		
B-CRATOS	H2020-FET Open	2021 – ongoing
ACROSS	H2020-EuroHPC	2021 – ongoing
Lexis	H2020-ICT-11	2021 – 2022
BoSS	IMEC-ICON	2018 – 2019
Fortissimo 2	H2020-FoF project	2016 – 2018
CloudFlow	FP7-I4MS project	2016 – 2017
MACH	ITEA2	2015 – 2016

MAIN INTERESTS

- High Performance Computing
- Machine Learning
- Quantum software and algorithms

SKILLS

Parallel Computing	■ ■ ■ ■ ■
Quantum Computing	■ ■ ■ ■ ■
Machine Learning	■ ■ ■ ■ ■
Research project management	■ ■ ■ ■ ■
Cloud technologies	■ ■ ■ ■ ■

Programming

C++	■ ■ ■ ■ ■
Python	■ ■ ■ ■ ■
CUDA	■ ■ ■ ■ ■
Fortran	■ ■ ■ ■ ■
Git	■ ■ ■ ■ ■

Soft

Presentations	■ ■ ■ ■ ■
Communication of results	■ ■ ■ ■ ■
Formalization of requirements	■ ■ ■ ■ ■
Decomposition of problems	■ ■ ■ ■ ■

Tools

- Keras
- MxNet
- Pandas
- BLAS/Lapack
- MPI/OpenMP
- Dask
- PBS/Slurm
- Docker
- Qiskit
- Openstack
- Gitlab CI
- Linux
- IP Networking
- Latex

CISCO CCNA course completed in 2008.

LANGUAGES

Italian	■ ■ ■ ■ ■
English	■ ■ ■ ■ ■
French	■ ■ ■ ■ ■

ACADEMIC ACTIVITY

Selected Publications

See paoloviviani.github.io/publications for full list.

1. Scionti, A., Viviani, P., Vitali, G., Vercellino, C. & Terzo, O. *Enabling the HPC and Artificial Intelligence Cross-Stack Convergence at the Exascale Level in HPC, Big Data, and AI Convergence Towards Exascale: Challenge and Vision First*, 22 (CRC Press, New York, Jan. 2022).
2. Scionti, A. et al. *Distributed HPC Resources Orchestration for Supporting Large-Scale Workflow Execution in HPC, Big Data, and AI Convergence Towards Exascale: Challenge and Vision First*, 23 (CRC Press, New York, Jan. 2022).
3. Reniers, V. et al. *Authenticated and Auditable Data Sharing via Smart Contract* in (Association for Computing Machinery, Brno, Czech Republic, 2020), 324–331.
4. Drocco, M., Viviani, P., Colonnelli, I., Aldinucci, M. & Grangetto, M. *Accelerating spectral graph analysis through wavefronts of linear algebra operations* in *Proc. of 27th Euromicro Intl. Conference on Parallel Distributed and network-based Processing (PDP)* (IEEE, Pavia, Italy, 2019), 9–16.
5. Reniers, V. et al. *Analysis of Architectural Variants for Auditable Blockchain-based Private Data Sharing* in *Proceedings of the 34th ACM/SIGAPP Symposium on Applied Computing* (ACM, Limassol, Cyprus, 2019), 346–354.
6. Viviani, P., Drocco, M., Baccega, D., Colonnelli, I. & Aldinucci, M. *Deep Learning at Scale in Proc. of 27th Euromicro Intl. Conference on Parallel Distributed and network-based Processing (PDP)* (IEEE, Pavia, Italy, 2019), 124–131.
7. Aldinucci, M. et al. *HPC4AI, an AI-on-demand federated platform endeavour* in *ACM Computing Frontiers* (Ischia, Italy, May 2018).
8. Tordini, F., Aldinucci, M., Viviani, P., Merelli, I. & Liò, P. *Scientific Workflows on Clouds with Heterogeneous and Preemptible Instances* in *Proc. of the Intl. Conference on Parallel Computing, ParCo 2017, 12-15 September 2017, Bologna, Italy* (IOS Press, 2018).
9. Viviani, P., Aldinucci, M., d'Ippolito, R., Lemeire, J. & Vucinic, D. *A Flexible Numerical Framework for Engineering—A Response Surface Modelling Application in Improved Performance of Materials: Design and Experimental Approaches* 93–106 (Springer International Publishing, Cham, 2018).
10. Viviani, P., Drocco, M. & Aldinucci, M. *Scaling Dense Linear Algebra on Multicore and Beyond: a Survey* in *Proc. of 26th Euromicro Intl. Conference on Parallel Distributed and network-based Processing (PDP)* (IEEE, Cambridge, United Kingdom, 2018).
11. Viviani, P., Torquati, M., Aldinucci, M. & d'Ippolito, R. *Multiple back-end support for the Armadillo linear algebra interface* in *In proc. of the 32nd ACM Symposium on Applied Computing (SAC)* (Marrakesh, Morocco, Apr. 2017), 1566–1573.

Other

- Co-supervisor of one M.Sc. Thesis
- Over 35 conference and journal papers reviewed
- Four PhD schools attended.
- Program Committee member, *Euromicro International Conference on Parallel, Distributed, and Network-based Processing (PDP)* for 2018 (also session chair), 2019 and 2020.
- Program Committee member, *Parallel Numerical Methods and Libraries for Heterogeneous Multi/Manycores (PDP2018 and PDP2019)*.
- Program Committee member, *Artifact Evaluation, Euro-Par 2018*
- Program Committee member, *16th IEEE International Conference on Scalable Computing and Communications (ScalCom 2016)*.



FREE TIME

Avid traveller and photographer.
Former track & field athlete, now turned to playground basketball.

 paoloviviani.github.io/portfolio

Photographer

OASIS Project

 2013  Kharga, Egypt

Archaeological expedition funded by
Fondazione Collegio delle Università
Milanesi and American University in Cairo.

Photographer

Collegio Universitario "R. Einaudi"

 2012 – 2014  Torino, Italy

Exchange student

Tauranga Boy's College

 2006  Tauranga, New Zealand


Scuba Diver

PADI Advanced Open Water Diver

 From 2004

Track and Field athlete

Javelin Throw – Regional and National competitions

 1997 – 2012



Volunteer

IAAF Athletics World Championship

 2009  Berlin, Germany

English Course

'General English Super Intensive' C1 level course at Alpha College of English

 2012  Dublin, Ireland

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