

# PAOLO VIVIANI

PhD – Senior Reasearcher

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## 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.

- Co-supervisor of one M.Sc. Thesis

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 Reasearcher, Advanced Computing

2021 – present   Torino, IT

- HPC, Machine Learning and Big Data convergence
- Quantum algorithms for industrial applications
- Funded research projects: proposals writing, project management and execution
- ETP4HPC Working groups member

Noesis Solutions

Reasearch 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
- Re-designed company-wide source code management workflow
- Technical contact for funded research projects

## Funded Research Projects

See [paoloviviani.github.io/projects](https://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
- Openstack
- PBS/Slurm
- Docker
- Qiskit
- Gitlab CI
- Linux
- IP Networking
- Latex
- Mathematica

CISCO CCNA course completed in 2008.

## LANGUAGES

Italian	●●●●●●
English	●●●●●●
French	●●●●●●

## ACADEMIC ACTIVITY

### Selected Publications

See [paoloviviani.github.io/publications](https://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. *Deep Learning at Scale with Nearest Neighbours Communications* PhD thesis (Computer Science Department, University of Torino, Sept. 2019).
7. 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.
8. Aldinucci, M. et al. *HPC4AI, an AI-on-demand federated platform endeavour* in *ACM Computing Frontiers* (Ischia, Italy, May 2018).
9. 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).
10. 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).
11. 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).
12. 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

- 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](https://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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