

# 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  
2021 – present   Torino, IT  
Advanced Computing, Photonics and Electromagnetism research area  
• HPC, Machine Learning and Big Data convergence.  
• Quantum computing.  
• Funded research projects.  
• 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
VaProFam	FlandersMake-ICON	2019 – 2021
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  
Cloud technologies  
Machine Learning  
Research project management  
Quantum Computing

### Programming

C++  
Python  
CUDA  
Fortran  
Git

### Soft

Presentations  
Communication of results  
Formalization of requirements  
Factorization 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

### Publications

1. Reniers, V. et al. *Authenticated and Auditable Data Sharing via Smart Contract* in (Association for Computing Machinery, Brno, Czech Republic, 2020), 324–331.
2. 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.
3. 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.
4. Viviani, P. *Deep Learning at Scale with Nearest Neighbours Communications* PhD thesis (Computer Science Department, University of Torino, Sept. 2019).
5. 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.
6. Aldinucci, M. et al. *HPC4AI, an AI-on-demand federated platform endeavour* in *ACM Computing Frontiers* (Ischia, Italy, May 2018).
7. 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).
8. 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).
9. Viviani, P., Drocco, M. & Aldinucci, M. *Pushing the boundaries of parallel Deep Learning - A practical approach*. *CoRR* **abs/1806.09528** (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.
12. Viviani, P. *Parallel Computing Techniques for High Energy Physics* MA thesis (Physics Department, University of Torino, 2015).

### 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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accordance with Italian Privacy Protection Law  
(30/06/2003, n.196/03), and GDPR  
(UE 2016/679)