Francesco Silvestri
Curriculum vitae

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PERSONAL DATA

First name	Francesco	Birth date	August 15, 1981
Last name	Silvestri	Birth place	Asolo (TV), Italy
Nationality	Italian	Gender	Male

RESEARCH TOPICS

My research targets algorithms and data structures, with an emphasis on:

○ Big data: how can we efficiently extract information from huge amounts of data?

○ High performance: how can we exploit modern hardware to crunch big data?

More specifically, I have been extensively working on: algorithms for modern architectures (e.g., processing in memory and hardware accelerators), parallel algorithms (e.g., MapReduce, BSP, network and multicore obliviousness), I/O efficient algorithms (e.g., cache-obliviousness, I/O efficient algorithms for database), algorithms for high dimensional data (e.g., similarity search, dimensionality reduction), graph mining (e.g., triangle and subgraph enumeration), fault-tolerant algorithms (e.g., resilient algorithms to silent memory errors).

EDUCATION

04/2009 **Ph.D. in Computer Engineering**, *University of Padova*
Supervisor: Andrea Pietracaprina; dissertation title: "Oblivious Computations on Memory and Network Hierarchies".

09/2005 **M.S. in Computer Engineering** ("Laurea Quinquennale"), *University of Padova*, *summa cum laude*
Supervisors: Andrea Pietracaprina and Geppino Pucci; thesis title "Simulation of D-BSP Parallel Programs on the Ideal Cache Hierarchy".

PROFESSIONAL APPOINTMENTS

Since 12/2019 **Associate Professor in Computer Engineering**, *Department of Information Engineering, University of Padova*

12/2016 - 11/2019 **Assistant Professor in Computer Engineering**, *Department of Information Engineering, University of Padova*

01/2015 - 11/2016 **Postdoctoral Researcher**, *IT University of Copenhagen*, ERC Project SSS (Scalable Similarity Search), Supervisor: Rasmus Pagh

10/2013 - 03/2014 **Part-time Lecturer and Visiting Scholar**, *IT University of Copenhagen*, host: Rasmus Pagh

02/2009 - 12/2014 **Postdoctoral Researcher**, *Department of Information Engineering, University of Padova*, Supervisor: Andrea Pietracaprina

10/2007 - 04/2008	**Visiting Scholar**, *Department of Computer Science, University of Texas at Austin*, host: Vijaya Ramachandran

Affiliations

2022-now	**Member and local flagship leader**, *National Center for HPC, big data and quantum computing*, ICSC Foundation, The center carries out research activities, at national and international level, for innovation in the field of simulations, computing and analysis of high-performance data.
2020-now	**Internal professor**, *Galilean School of Higher Education*, It's a school of excellence for gifted students of the University of Padova.
2020-2022	**Member**, *SMACT Competence Center for Industry*, SMACT is a center for the creation and sharing of value in the digital transformation processes of companies.

TEACHING

Courses

2020-now	**Big Data Computing**, *University of Padova*
2020-now	**Algorithm Design**, *Galilean School of Higher Education*
2017-now	**Computer Architecture**, *University of Padova*
2016	**Algorithm Engineering**, *IT University of Copenhagen*
2016, 2015	**Advanced Algorithms Seminars**, *IT University of Copenhagen*
2015	**Algorithm Design Project**, *IT University of Copenhagen*
2013	**Algorithm Design II**, *IT University of Copenhagen*
Before 2014	**Teaching assistant**, *Data Mining (2014,2013), Large Data Sets (2010, 2008), Introduction to Probability (2007), Algorithms and Data Structures I (2006)*, University of Padova

Pedagogical training

2018	**Program "Teaching for Learning" for assistant professors**, *University of Padova* A series of workshops (31 hours) on methods and tools for improving teaching quality.
2014-2016	**Workshops on university teaching**, *IT University of Copenhagen*, Workshops topics: Teaching computational competencies; Use your voice; Project and Thesis Supervision; Flipped Learning; Introduction to teaching at ITU; Develop you professional skills as an examiner
2014	**Course "University Teaching 101"**, *Johns Hopkins University*

PUBLICATIONS

See `http://www.dei.unipd.it/~silvestri/publications/` for the complete list of publications.

AWARDS

2023	**Best Paper Award**, *Proc. 26th International Conference on Database Theory (ICDT)* Award for the paper: Shiyuan Deng, Francesco Silvestri and Yufei Tao, "The I/O Complexity of Enumerating Subgraphs of Constant Sizes."

2021	**ACM SIGMOD Research Highlight Award**
	Award for the paper "M. Aumüller, R. Pagh and F. Silvestri. Fair Near Neighbor Search: Independent Range Sampling in High Dimensions. In Proc. of ACM Symposium on Principles of Database Systems (PODS), 2020".
2019	**Runner up for the Facebook AI System Hardware/Software Co-Design research awards**
	88 submitted projects: 8 projects were awarded as winners, 8 as runners-ups.
2010	**Best Paper Award in the Algorithmic Track**, *24th IEEE International Parallel & Distributed Processing Symposium, USA*
	Award for the paper: R. A. Chowdhury, F. Silvestri, B. Blakeley, V. Ramachandran, "Oblivious Algorithms for Multicores and Networks of Processors"
2008	**IEEE TCPP Travel Award**, *Ph.D. Forum of the 22nd IEEE International Parallel & Distributed Processing Symposium, USA*
2007	**IEEE TCPP Travel Award**, *21st IEEE International Parallel & Distributed Processing Symposium, USA*

RESEARCH GRANTS

2023-2026	**Marsden Fund - New Zealand**, *Associate P.I. of the Marsden Fund (P.I. Ninh Pham) with the project "Federated Nearest Neighbour Search: Theory and Practice"*
2022-2023	**Huawei Young Talents program**, *P.I. of sponsorship by Huawei for the activities on competitive programming of The Coding DEI*
2022-2024	**Uni-Impresa, University of Padova**, *P.I. of project "Big-Mobility: Big Data Analytics for Mobility", in collaboration with Motion Analytica S.r.l.*
2021-2022	**SMACT IRISS Project on quality and fault prediction for high precision mechanical components**, *SMACT Competence Center for Industry 4.0 (P.I.)*
2020-2021	**SMACT IRISS Project on graph database**, *SMACT Competence Center for Industry 4.0 (P.I.)*
2018-2019	**BIRD project, Dept. of Inf. Engineering, University of Padova**, *P.I. of the project "Trajectory analytics for gait analysis"*
2018	**University of Padova**, *Travel grant for international collaborations*
2014-2017	**MIUR-PRIN project**, *AMANDA: Algorithmics for MAssive and Networked DAta*, Role: task leader
2013, 2011	**University of Padova**, *Senior Research Fellowship*
2013, 2011	**Amazon Web Services (AWS)**, *AWS in Education research grant*
Since 2006	**Participation in the following projects**: Progetto SID 2017 (2019-2017), ERC SSS (2014-2019), MIUR Projects AMANDA (2014-2017), ALGODEEP (2010–2012), MAINSTREAM (2007–2009), ALGONEXT (2004–2006); University of Padova Strategic Project STPD08JA32 (2010–2012); AURORA Project of Trento Province and INFN (2009–2011); European Project FET-IST FP6 AEOLUS (2005–2009).

SERVICE TO THE SCIENTIFIC COMMUNITY

Student supervision

PhD students	Mariafiore Tognon (from 2024), Ling Han Zeng (from 2023, co-supervisor with Ninh Pham), Fabrizio Boninsegna (from 2022).
Research collaborators	Francesco Pio Monaco (from 2024), Mariafiore Tognon (2024), Lorenzo Padoan (2023-2024), Stefano Alberton (2023)
Master and bachelor	more than 40 master students and 20 bachelor students since 2016.

Program and organizing committees

Program Committees	ACM Symposium on Principles and Practice of Parallel Programming (PPoPP, 2025), IEEE International Parallel & Distributed Processing Symposium (IPDPS, 2025, 2016, 2015, 2013), IPDPS Workshop on Graphs: Architectures, Programming, and Learning (GrAPL, 2024, 2023), Int. European Conference on Parallel and Distributed Computing (Euro-Par, 2024, 2022), ACM Principles of Database Systems Symposium (PODS, 2023, 2017), European Symposium on Algorithms (ESA, Track A 2023, Track B, 2019, 2015), Int. Symposium on Algorithms and Computation (ISAAC, 2022), ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD, 2022), SIAM International Conference on Data Mining (SDM, 2022), The Web Conference (WWW, 2022, 2021, 2020, 2019, 2018), International Symposium on Algorithmic Aspects of Cloud Computing (ALGOCLOUD, 2020), IEEE Cluster (Cluster, 2019, 2018, 2017), International Colloquium on Automata, Languages, and Programming (ICALP, 2019), International Conference on Parallel Processing (ICPP, 2019), Workshop on Algorithms and Systems for MapReduce and Beyond (BeyondMR, 2018, 2017), International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD, 2017, 2016), International Joint Conference on Artificial Intelligence (IJCAI, 2016), ACM/IEEE Supercomputing Conference (SC, workshop selection 2015, poster selection 2014, 2013), Workshop on Massive Data Algorithmics (MASSIVE, 2014),IEEE International Conference on Big Data (BigData, 2013).
Organizing Committees	IEEE International Parallel & Distributed Processing Symposium (IPDPS, publicity chair, 2025, 2023, 2022, 2021, 2017; publicity co-chair, 2016-2013), IEEE Cluster (Cluster, publicity co-chair, 2015), ACM International Conference on Supercomputing (ICS, submission co-chair, 2012), European Summer School in Information Retrieval (ESSIR, 2009).

Editoral boards

2025	Track Chair of 31st International European Conference on Parallel and Distributed Computing, track "Theory and Algorithms"
2023-ora	Associate editor of the ACM Transactions on Parallel Computing
2019	Guest Editor of the special issue "Big Data Algorithmics" of the journal "Algorithms".

Project reviewing

Grants	National Science Center of Poland (2018)

University service

2024-now	**Study Program Vice-Coordinator of MSc degree in Cybersecurity**, *University of Padova*
2023-now	**Member of the commission for teaching timetable**, *University of Padova*

2021-now	**Member of the "Commissione Scientifica Area n.11"**, *University of Padova*
2017-now	**Member of the Formative Tutoring Program**, *Department of Information Engineering, University of Padova*
2018-now	**Member of the PhD School Board**, *Department of Information Engineering, University of Padova*

Other activities

2018-now	**Organizer and founder of "The Coding DEI"**, *Department of Information Engineering, University of Padova*
2018-now	**Popularizing algorithms**, *Introducing algorithms and computational thinking to kids (5-10 years)*

PROFESSIONAL EXPERIENCES

Professional Qualifications

2022	National Scientific Qualification as full professor in Computer Science (INF/01) and Computer Engineering (ING-INF/05).
2006	Admitted to the Italian Engineering Association.

Main scientific collaborations

Ongoing	ETH Zurich (Juan Gómez Luna), Auckland University (Ninh Pham) University of Copenhagen (R. Pagh), IT University of Copenhagen (M. Aumüller), University of Trento (F. Vella).
Past	University of Bonn (A. Driemel), City University of New York (M. Goswami), MIT (I. Razenshteyn), Korea Advanced Institute of Science and Technology (U Kang), University of Delaware (M. Taufer), Brown University (E. Upfal), Universidade Federal do Rio Grande do Sul (P. Rech), Sapienza University of Rome (I. Finocchi), University of Texas at Austin (V. Ramachandran), Stony Brook University (R. A. Chowdhury).

Participation to invitation-only workshops

2023	Dagstuhl Seminar "Scalable Data Structures"
2021	Dagstuhl Seminar "Scalable Data Structures"
2019	Facebook AI Systems Faculty Summit
2019	Dagstuhl Seminar "Theoretical Foundations of Storage Systems"
2019	Dagstuhl Seminar "Data Structures for the Cloud and External Memory Data"
2018	Workshop on Scalable Approaches to High Performance and High Productivity Computing
2017	Dagstuhl Seminar "Theory and Applications of Hashing"
2017	Hawaii Workshop on Parallel Algorithms and Data Structures
2016	Dagstuhl Seminar "Data Structures and Advanced Models of Computation on Big Data"
2014	Workshop on Scalable Approaches to High Performance and High Productivity Computing
2012	Workshop on Scalable Approaches to High Performance and High Productivity Computing

2010	Workshop on Scalable Approaches to High Performance and High Productivity Computing.

Invited seminars

2022	Training days "Road to Industry 4.0" by Carraro group. Talk: "Big Data"
2022	Campus "Digital Transformation Training" by SMACT Competence Center for managers and entrepreneurs. Talk: "Introduction to Big Data"
2020	Indo-German Spring School on Algorithms for Big Data. Title: Accelerating algorithms with Tensor Core Units
2019	Accademia Galileiana di Scienze, Lettere ed Arti. XIX Seminario di Tecnologie dell'Informazione. Title: "Chi si somiglia si piglia" algoritmi per trovare somiglianze nei Big Data.
2018	Free University of Bozen. Title: Distance-sensitive Hashing.
2018	University of Rome "Tor Vergata", Title: Distance-sensitive Hashing.
2017	IT University of Copenhagen. Title: Locality-sensitive hashing for curves.
2014	ENS de Lyon. Title: The Input/Output Complexity of Triangle Enumeration.
2014	University of Southern Denmark. Title: The Input/Output Complexity of Triangle Enumeration.
2013	IT University of Copenhagen. Title: Space-Round Tradeoffs for MapReduce Computations.
2011	Workshop on Recent Advances in Data Structures (Chennai, India). Title: Resilient Data Structures.
2010	Sapienza University of Rome. Title: Obliviousness in the Parallel Settings.

Languages

○ Italian: mother tongue;

○ English: full professional proficiency;