

# SILVIA DI FRANCESCO

## Associate Professor in Hydraulics Niccolò Cusano University – Italy

📍 38, Via della Moda, Perugia, 06125, Italy

✉ [Silvia.difrancesco@unicusano.it](mailto:Silvia.difrancesco@unicusano.it)

Skype: [silvia.difrancesco](https://www.skype.com/people/silvia.difrancesco)

Sex Female | Date of birth 07/09/1979 | Nationality italian



## MAIN WORK EXPERIENCES

- ✓ 2021-currently Associate professor in hydraulics at Niccolò Cusano University in Rome.
- ✓ 2013 - currently. Professor of Hydraulics and Hydrology and water supply systems in Bachelor of Science and Master of Science degree in Civil Engineering (Niccolò Cusano University).
- ✓ 2018 - 2021. Tenure track researcher (RTDB) in hydraulics (code of the academic discipline 08/A1) at Niccolò Cusano University in Rome.
- ✓ 2013 - 2018. Assistant professor in Hydraulics at Engineering Faculty of Niccolò Cusano University in Rome
- ✓ 2006 - 2013. Contract researcher in the scientific area of hydrology and hydraulic works (University of Perugia and Honors Center of Italian Universities Rome La Sapienza)

## EDUCATION AND TRAINING

- ✓ 2010. Doctor of Philosophy degree (PhD) in Civil Engineering, water section area at University of Perugia.
- ✓ 2006. Master diploma in Expert in management, evaluation and control of pollutants by Umbria Region.
- ✓ 2004. Graduated in Environmental Engineering (MD) at the University of Perugia.

## TEACHING ACTIVITY

### BACHELOR'S AND MASTER'S DEGREES

- ✓ 2021-currently Adjunct Professor of Hydraulic Protection of territory for MS Degree in Civil engineering, Niccolò Cusano University, Rome

- ✓ 2015-currently Adjunct Professor of Hydraulics and of Hydrology and Water Supply Systems courses for BS degree and MS Degree in Civil engineering, Niccolò Cusano University, Rome
- ✓ 2014-2015, Adjunct Professor of Hydraulic Works course for BS degree in Civil engineering, Niccolò Cusano University
- ✓ 2013-2014, 2014-2015 Adjunct Professor of Hydraulics course for MS degree course in Mechanical Engineering and BS degree in Civil engineering, Niccolò Cusano University, Rome
- ✓ 2010-2011 Contract professor at Course: Elements of hydraulics and hydraulic works, University G. D'Annunzio Pescara- Chieti, Natural science faculty.
- ✓ 2005-2010 Tutor and member of the examination commission for the following BS and MSCourses: Hydraulic Works, Water supply systems, Waste water treatment at Engineering Faculty of Perugia University .

### PHD COURSES

- ✓ Co-supervisor of PhD candidate in the framework of the PhD course in Civil and Environmental Engineering)- Università degli Studi di Firenze, Pisa, Perugia- Technical University (TU) of Braunschweig. Research title: Lattice Boltzmann shallow water equations for large scale hydraulic analysis (2015-2018).
- ✓ Since 2017 Co-supervisor of PhD candidate in the framework of in Industrial and Civil engineering Doctorate School, Niccolò Cusano University. Research title: integrated flood risk studies in Sicily.

### ACADEMIC APPOINTMENTS

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- ✓ Since 2023 Quality assurance (AQ) Referee for engineering area degree courses of Niccolò Cusano University
- ✓ Since a. a. 2015-2016 Member of Teachers board at Industrial and Civil engineering Doctorate School, Niccolò Cusano University
- ✓ 2014-2017 Member of the research area board of Niccolò Cusano University
- ✓ Since 2017 member of the review board of Civil engineering degree course, Niccolò Cusano University
- ✓ Since 2017 Deputy of Niccolò Cusano university within the agreement Memorandum Of Understanding (MOU) On Educational, Research And Technological Cooperations between Yazd University, Iran and Niccolò Cusano University, Italy
- ✓ Since 2017 Deputy of Niccolò Cusano university within the agreement Memorandum Of Understanding (MOU) for joint research activities on sustainable surface and groundwater- Unesco Chair for Water reuse at University of Tehran (Iran), Unesco Center ICWQC of Yazd (Iran), CNR-IRPI (Perugia), UNESCO chair in water resources management and culture (Perugia), DICA- University of Perugia, Niccolò Cusano University

### SCIENTIFIC ACTIVITY

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Main areas of research activity include:

- ✓ Evaluation and management of the water resource with remote sensing techniques in a GIS environment

- ✓ Computational fluid dynamics applied to hydraulic engineering works: Hydraulic risk analysis, Lattice Boltzmann Method for free surface flows, 2D- 3D Analysis of environmental flow and pollutant dispersion

Author of more than 70 papers published on national and international, referred journals. Bibliometric indices (Database SCOPUS) (access 23 June 2023):

<https://www.scopus.com/authid/detail.uri?authorId=35368328500> Total citations = 627, H-index = 15, Documents = 47

#### **ORGANIZATION AND COORDINATION OF SCIENTIFIC ACTIVITIES**

- ✓ Member of the Local Organization Committee - General Assembly - International Union of Geodesy and Geophysics (IUGG), Perugia, July 2007. More than 4000 scientists from 60 different countries participated at this event.
- ✓ Member of the Local Organizing Committee of the scientific symposium: Galileo e l'Acqua: guardare il cielo per capire la terra, Archivio di stato di Roma, Biblioteca Alessandrina, Roma 17-18 Dicembre 2009.
- ✓ Member of the organizing committee of the conference "Diga 33 - Viaggio attraverso 33 dighe nel mondo. Utilizzi, soluzioni costruttive e impatto socio-economico", 19 maggio 2012 Magione (PG) within the Umbria Water Festival Perugia, 17-20 May 2012.
- ✓ Member of the organizing committee of the international workshop "Climate Changes: flood/drought dynamics", Terni C.A.O.S Centro Arti Opificio Siri Viale Campofregoso, 98 – Terni, 18 May 2012
- ✓ Member of the organizing committee of the conference Freshwater and Culture, Water Resources Management and Culture, Padiglione KIP Interna@onal School - EXPO Milano 2015 October 6--7 2015
- ✓ Member of the scientific committee of the 1st UNESCO Water Chair meeting, University for Foreigners of Perugia , October 2016, Palazzo Gallenga, Perugia, ITALY, 24-26 October 2016.
- ✓ Member of the organizing committee of the workshop "Yazd University (Iran) and Cusano University: new cooperation perspectives", University Niccolò Cusano, Roma, 17-09-2017.

#### **AFFILIATION TO SCIENTIFIC SOCIETIES**

- ✓ Affiliated of Unesco Chair "Water Resources Management and Culture" established in 2013 by University for Foreigners of Perugia and Honors Center of Italian Universities H2CU.
- ✓ Member of Comitato Italiano per l'Irrigazione e la Bonifica Idraulica (ITAL- I.C.I.D, International Commission on Irrigation and Drainage) - Ministero delle politiche agricole e forestali
- ✓ Member of the European Geophysical Union, EGU
- ✓ Member of GII, Italian group of Hydraulics
- ✓ Member of Italian hydrological society (SII)

#### **ACTIVITY IN SCIENTIFIC PUBLISHING**

- ✓ Editor of the volume "Diga 33: viaggio attraverso 33 dighe nel mondo. Utilizzi, soluzioni costruttive e impatto socio-economico", in the framework of the Umbria Water Festival, 18-20 Maggio 2012
- ✓ referee for international journals, book publishers and international conference proceedings (Elsevier, Wiley, MDPI).
- ✓ Guest editor for special issue "Combined Numerical and Experimental Methodology for Fluid–Structure Interactions in Free Surface Flow" Water-MDPI (ISSN 2073-4441, IF 3.103)
- ✓ Member of the editorial board of the journal Water-MDPI (ISSN 2073-4441, IF 3.103)

- ✓ Member of the editorial board of the American Journal of Engineering and Applied Sciences (ISSN 1941-7020)
- ✓ Review editor for the journal Frontiers in water (ISSN 2624-9375)

#### VISITING POSITIONS AND INVITED SEMINARS

- ✓ 2006 Invited speaker at the 5th World Water Day, Roma, Accademia dei Lincei, March 23, 2009
- ✓ 2008 Invited speaker at the Symposium "The role of hydrology in water resources management", organised by The IHP-Committee of Italy, sponsored by IAHS and co-sponsored by UNESCO, Capri, October 2008
- ✓ 2009 Invited speaker at the Unesco - IHP International Hydrological Program Workshop "Water for life: System under Stress and Societal Responses", Rome, July 15 2009.
- ✓ 2010 Invited visiting researcher at City University College of New York

#### RESEARCH PROJECTS

- ✓ Leader of the local research unit of the project "Small reservoirs restoration: Green blue infrastructures to enhance rural area resilience To climate change" (SIGHTING), funded by the Italian Ministry of Education, University and Research (PRIN 2022).
- ✓ Leader of the local research unit of the project "Combined numerical and experimental methodology for fluid structure interaction in free surface flows under impulsive loading" (NEMESIS), funded by the Italian Ministry of Education, University and Research under PRIN grant No. 20154EHYW9 (PRIN 2015).
- ✓ Member of the Research Team - Implementation of the integrated and organic maintenance activities in the Tiber River basin - Friends of the earth international - Tiber River Basin Authority.
- ✓ Member of the research team - "Multidisciplinary Study for Hydraulic and Environmental Protection of the River Basin Tescio". Department of Civil and Environmental Engineering (DICA) University of Perugia - Mountain Community "Monte Subasio".
- ✓ Member of the research team - Tiber river basin - Hydraulic study aimed at the definition of flood Risk Areas -Department of Civil and Environmental Engineering (DICA) - Arezzo province
- ✓ Member of the research team- TIAR rural housing with innovative Energy Autonomy: hydro energy rural tower" Department of Civil and Environmental Engineering (DICA) University of Perugia
- ✓ Member of the research team- MALF -Managing Archeological Landscape in Fluvial environment- University of Foreigners of Perugia

#### SELECTED PUBLICATIONS

1. Di Francesco S, Venturi S, Casadei S (2023). An integrated water resource management approach for Lake Trasimeno, Italy. HYDROLOGICAL SCIENCES JOURNAL, p. 1-15, ISSN: 0262-6667, doi: 10.1080/02626667.2023.2185150
2. Khoshkonesh A, Daliri M, Riaz K, Dehrashid F A, Bahmanpouri F, Di Francesco S (2022). Dam-break flow dynamics over a stepped channel with vegetation. JOURNAL OF HYDROLOGY, vol. 613, Part A, 128395, ISSN: 0022-1694, doi: 10.1016/j.jhydrol.2022.128395
3. Di Francesco, S., Casadei, S., Di Mella, I. et al. (2022) The Role of Small Reservoirs in a Water Scarcity Scenario: a Computational Approach. Water Resour Manage . <https://doi.org/10.1007/s11269-021-03052-6>
4. Daneshfaraz R, Ghaderi A, Sattariyan M, Alinejad B, Asl MM, Di Francesco S (2021). Investigation of local scouring around hydrodynamic and circular pile groups under the influence of river material harvesting pits. WATER, vol. 13, 2192, ISSN: 2073-4441, doi: 10.3390/w13162192

5. Ghaderi A, Abbasi S, Di Francesco S (2021). Numerical Study on the Hydraulic Properties of Flow over Different Pooled Stepped Spillways. WATER, vol. 13, ISSN: 2073-4441, doi: 10.3390/w13050710
6. Biscarini C, Di Francesco S, Casadei S, Venturi S, Manciola P (2021). Vulnerability of Hydraulic Constructions in Flood-Prone Agricultural Areas . WATER, vol. 13 (11), 1549, ISSN: 2073-4441, doi: 10.3390/w13111549
7. Venturi S, Di Francesco S, Geier M, Manciola P (2020). Modelling flood events with a cumulant CO lattice Boltzmann shallow water model. NATURAL HAZARDS, ISSN: 0921-030X, doi: 10.1007/s11069-020-04378-x
8. Venturi S, Di Francesco S, Geier M., Manciola P. (2019). A new collision operator for lattice Boltzmann shallow water model: a convergence and stability study . ADVANCES IN WATER RESOURCES, 103474, ISSN: 0309-1708, doi: 10.1016/j.advwatres.2019.103474
9. Ridolfi E, Di Francesco S, Pandolfo C, Berni N, Biscarini C, Manciola P (2019). Coping with Extreme Events: Effect of Different Reservoir Operation Strategies on Flood Inundation Maps . WATER, vol. 11(5), 982, ISSN: 2073-4441, doi: 10.3390/w11050982
10. Di Francesco S, Biscarini C, Montesarchio V, Manciola P (2016). On the role of hydrological processes on the water balance of Lake Bolsena, Italy. LAKES & RESERVOIRS, vol. 21, p. 45-55, ISSN: 1440-1770, doi: 10.1111/lre.12120
11. Biscarini C, Di Francesco S, Ridolfi E, Manciola P (2016). On the simulation of floods in a narrow bending valley: the Malpasset dam break case study. WATER, vol. 8, 545, ISSN: 2073-4441, doi: 10.3390/w8110545
12. Di Francesco S, Biscarini C, Manciola P (2015). Numerical simulation of water free-surface flows through a front-tracking lattice Boltzmann approach. JOURNAL OF HYDROINFORMATICS, vol. 17, p. 1-6, ISSN: 1464-7141, doi: 10.2166/hydro.2014.028
13. Zarghami A, Di Francesco S, Biscarini C (2014). Porous substrate effects on thermal flows through a rev-scale finite volume lattice boltzmann model. INTERNATIONAL JOURNAL OF MODERN PHYSICS C, vol. 25, 1350086, ISSN: 0129-1831, doi: <http://dx.doi.org/10.1142/S0129183113500861>
14. Nardi F, Biscarini C, Di Francesco S, Manciola P, Ubertini L (2013). Comparing a large-scale DEM based delineation algorithm with standard floodmaps: the Tiber river case study. IRRIGATION AND DRAINAGE, vol. 62, p. 11-19, ISSN: 1531-0361, doi: 10.1002/ird.1818
15. Biscarini C, Di Francesco S, Nardi F, Manciola P (2013). Detailed simulation of complex hydraulic problems with macroscopic and mesoscopic mathematical methods. MATHEMATICAL PROBLEMS IN ENGINEERING, vol. 2013, 928309, ISSN: 1024-123X, doi: 10.1155/2013/928309
16. Biscarini C, Di Francesco S, Mencattini M (2011). Application of the lattice Boltzmann method for large-scale hydraulic problems. INTERNATIONAL JOURNAL OF NUMERICAL METHODS FOR HEAT & FLUID FLOW, vol. 21, p. 584-601, ISSN: 0961-5539, doi: <http://dx.doi.org/10.1108/09615531111135846>
17. Falcucci G, Ubertini S, Biscarini C, Di Francesco S, Chiappini D, Palpacelli S, De Maio A, Succi S (2011). Lattice boltzmann methods for multiphase flow simulations across scales. COMMUNICATIONS IN COMPUTATIONAL PHYSICS, vol. 9, p. 269-296, ISSN: 1815-2406, doi: 10.4208/cicp.221209.250510a
18. BISCARINI, CHIARA, DI FRANCESCO, SILVIA, MANCIOLA, Piergiorgio (2010). CFD modelling approach for dam break flow studies. HYDROLOGY AND EARTH SYSTEM SCIENCES, vol. 14/2010, p. 705-718, ISSN: 1027-5606, doi: 10.5194/hess-14-705-2010