

Piergiorgio Manciola - Scientific and Academic Resume - 2021, March

Personal information

Name: Piergiorgio Manciola

Nationality: Italian

Place of birth Monte San Pietrangeli (FM)

Date of birth: January 8th, 1954

Position: Full professor, Disciplinary scientific sector: ICAR02 (Hydraulic constructions, maritime constructions and hydrology)

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Education and training:

Civil engineering degree with a major in Hydraulics from Sapienza, University of Rome, December 19, 1979 - *cum laude*

1. Research activity

Research activity focused on the scientific sector ICAR02 (Hydraulic Constructions, Maritime Constructions and Hydrology) main topics: water supply and management, dams, pipelines, hydraulic works, flood and draughts, fluvial hydraulics, water resources planning and management, computational fluid dynamics.

Most recent research advancements pertain to three main activities: i) surface water simulations; ii) flood hazard and risk assessment, modelling and mapping; iii) GIS for urban/land planning and management.

Research work dealt in particular with surface flows integrated analyses in critical conditions by means of most advanced numerical algorithms 1D, 2D, 3D for fluvial simulations with specific regard to singularities such as: i) Dam/Embankment Break processes, ii) interaction with infrastructures of roads such as bridges, embankments and culverts. In this regard, continuous models are coupled with mesoscopic models like the Lattice Boltzmann (LBM) scheme.

Another research concerned the development and application of advanced GIS tools, based on digital elevation models (DTM, DSM) for: i) hydraulic risk assessment and mapping, ii) design of mitigation systems of floods.

Most recent technical and scientific research activity deals with gravity arch dams: i) static and dynamic FEM modeling, including construction joints; ii) permanent monitoring of seismic behavior; iii) UAV survey of vertically developed structures: accuracy, precision, control of results.

The results of the research were disseminated with 112 papers published in journals and on national and international conference proceedings in the disciplinary sectors of

Hydraulic Constructions, Hydrological Modeling, Works for the Hydraulic Defense of the Territory, Management of Water Resources and Computational Fluid Dynamics.

2. Teaching activity

Prof. Piergiorgio Manciola has been a lecturer since 1984 teaching in graduate and undergraduate degrees in the University of Perugia, University of Ancona, Sapienza University of Rome also providing his teaching activity in national and international seminars at the graduate and post-graduate level (masters and post-docs).

3. Chronological order of academic duties

- since 2018 Professor Lecturing on *Advances in Hydraulics Works* at Civil Engineering Master's Degree Course, University of Perugia
- since 2002 Professor Lecturing on *Hydraulic Works* at Civil Engineering Master's Degree Course, University of Perugia
- since 2002 Professor Lecturing on *Municipal Water Systems*, Civil Engineering Degree Course, University of Perugia;
- since 2002 Professor Lecturing on *Sanitary Engineering Environment* at Environmental Engineering Master's Degree Course, University of Perugia;
- 2008-'10 Principal lecturer of the “*design activity*” Course, Civil Engineering Degree, Hydraulic Infrastructure Module;
- 1998 -'03 Adjunct professor lecturing on *River basin hydraulic mitigation works*, Environmental Engineering Degree of the Engineering Faculty of University of Perugia;
- 1997-'02 Associate Professor Lecturing on *Hydraulic Works* at Agricultural Faculty of the University of Perugia;
- 1997 -'98 Adjunct Professor Lecturing on *Drainage and Hydraulic Works*, bachelor's degree at Engineering Faculty of University of Perugia;
- 1996 -'97 Adjunct Professor Lecturing on *Hydraulic Works* at Engineering Faculty of University of Perugia for Academic Diploma students;
- 1996 -'97 Adjunct Professor Lecturing on *Hydraulic Works* at Engineering Faculty of University of Perugia.
- 1992 -'97 Associate Professor Lecturing, *Drainage Techniques* at Agricultural Faculty of the University of Perugia
- 1993 -'96 Adjunct Professor Lecturing on *Hydraulic Works Techniques* at Engineering Faculty of Sapienza University of Rome.
- 1992 -'96 Adjunct Professor Lecturing on *Agricultural Hydraulics* at Agricultural Faculty of the University of Ancona;
- 1994 - '95 Adjunct Professor Lecturing on *Agricultural Hydraulics* at Agricultural Faculty of the University of Perugia.
- 1993-'96 Adjunct Professor Lecturing on *Hydraulic Works Techniques* at Engineering Faculty, Sapienza University of Rome.
- 1990 - '93 Lecturer for the *River Mitigation Works* course, Engineering Faculty, University of Perugia
- 1984 - '92 Researcher at the Agricultural Hydraulics Institute of University of Perugia, lecturing in Hydraulics Courses;

1981 - '83 Teaching activity in *Irrigation and Drainage*, Institute of Hydraulic Works, Faculty of Engineering, Sapienza University of Rome.

4. Professional and Scientific Associations

- GNI National Group of Hydraulics.
- ICID International Commission on Irrigation and Drainage.
- IAHS International Association of Hydrological Science.
- AII Italian Association of Hydrotecnic
- CIPLA Inter-University center for the Environment of University of Perugia
- ITCOLD Italian Commission on Large Dams
- Order of Engineers Perugia

5. Selection of International peer review publications (Scopus Index: 2007-2020)

Venturi S., Di Francesco S., Geier M., Manciola P. (2020). *A new collision operator for lattice Boltzmann shallow water model: a convergence and stability study*. ADVANCES IN WATER RESOURCES, vol. 135, p. 103474-103487, ISSN: 0309-1708, doi: 10.1016/j.advwatres.2019.103474

Venturi, Sara, Di Francesco, Silvia, Geier, Martin, Manciola, Piergiorgio (2020). *Forcing for a Cascaded Lattice Boltzmann Shallow Water Model*. WATER, vol. 12, p. 439-454, ISSN: 2073-4441, doi: 10.3390/w12020439

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

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, ISSN: 2073-4441, doi: 10.3390/w11050982

Ridolfi, E., Manciola, P., *Water level measurements from drones: A Pilot case study at a dam site* (2018) Water (Switzerland), 10 (3), art. no. 297. DOI: 10.3390/w10030297

Venturi, S., Di Francesco, S., Manciola, P., Geier, M., *A central moments model for shallow water equations: Convergence analysis* (2018), AIP Conference Proceedings, 1978, art. no. 420007. DOI: 10.1063/1.5044010

Cavalagli, N., Biscarini, C., Facci, A.L., Ubertini, F., Manciola, P., *Experimental analysis on slamming reduction in rectangular liquid tanks subjected to harmonic motion* (2018), AIP Conference Proceedings, 1978, art. no. 420006. DOI: 10.1063/1.5044009

Buffi, G., Manciola, P., Grassi, S., Barberini, M., Gambi, A., *Survey of the Ridracoli Dam: UAV-based photogrammetry and traditional topographic techniques in the inspection of vertical structures* (2017), Geomatics, Natural Hazards and Risk, 8 (2), pp. 1562-1579. DOI: 10.1080/19475705.2017.1362039

Ridolfi, E., Buffi, G., Venturi, S., Manciola, P., *Accuracy analysis of a dam model from drone surveys* (2017), *Sensors* (Switzerland), 17 (8), art. no. 1777. DOI: 10.3390/s17081777

Buffi, G., Manciola, P., De Lorenzis, L., Cavalagli, N., Comodini, F., Gambi, A., Gusella, V., Mezzi, M., Niemeier, W., Tamagnini, C., *Calibration of finite element models of concrete arch-gravity dams using dynamical measures: The case of Ridracoli* (2017), *Procedia Engineering*, 199, pp. 110-115. DOI: 10.1016/j.proeng.2017.09.16

Biscarini, C., Francesco, S.D., Ridolfi, E., Manciola, P., *On the simulation of floods in a narrow bending valley: The Malpasset dam break case study* (2016), *Water* (Switzerland), 8 (11), art. no. 545. DOI: 10.3390/w8110545

Di Francesco, S., Biscarini, C., Manciola, P. *Characterization of a flood event through a sediment analysis: The Tescio river case study* (2016), *Water* (Switzerland), 8 (7), art. no. 308. DOI: 10.3390/w8070308

Di Francesco, S., Biscarini, C., Pierleoni, A., Manciola, P., *An engineering based approach for hydraulic computations in river flows* (2016), *AIP Conference Proceedings*, 1738, art. no. 270012. DOI: 10.1063/1.4952051

Pierleoni, A., Di Francesco, S., Biscarini, C., Manciola, P., *Numerical approach for the evaluation of Weibull distribution parameters for hydrologic purposes* (2016), *AIP Conference Proceedings*, 1738, art. no. 270013. DOI: 10.1063/1.4952052

Di Francesco, S., Biscarini, C., Montesarchio, V., Manciola, P., *On the role of hydrological processes on the water balance of Lake Bolsena, Italy* (2016), *Lakes and Reservoirs: Research and Management*, 21 (1), pp. 45-55. DOI: 10.1111/lre.12120

Venturi, S., Di Francesco, S., Materazzi, F., Manciola, P., *Unmanned aerial vehicles and Geographical Information System integrated analysis of vegetation in Trasimeno Lake, Italy* (2016), *Lakes and Reservoirs: Research and Management*, 21 (1), pp. 5-19. DOI: 10.1111/lre.12117

Manciola, P., Venturi, S., Pierleoni, A., *Hydraulic control of culvert on floodplain simulation* (2015), *AIP Conference Proceedings*, 1648, art. no. 570021. DOI: 10.1063/1.4912807

Di Francesco, S., Biscarini, C., Manciola, P., *Numerical simulation of water free-surface flows through a front-tracking lattice Boltzmann approach* (2015), *Journal of Hydroinformatics*, 17 (1), pp. 1-6. DOI: 10.2166/hydro.2014.028

Cotana, F., Belardi, P., Manciola, P., Tamagnini, C., Materazzi, A.L., Fornaciari, M., Petrozzi, A., Pisello, A.L., Cavalaglio, G., Coccia, V., Pagnotta, G., Menchetelli, V., Di Francesco, S., Salciarini, D., Cavalagli, N., Ubertini, F., Orlandi, F., Bonofiglio, T., *TIAR: Renewable energy production, storage and distribution; a new multidisciplinary*

approach for the design of rural facility (2014), Energy Procedia, 45, pp. 323-332. DOI: 10.1016/j.egypro.2014.01.035

Nardi, F., Biscarini, C., Di Francesco, S., Manciola, P., Ubertini, L., *Comparing a large-scale dem-based floodplain delineation algorithm with standard flood maps: The Tiber river basin case study* (2013), Irrigation and Drainage, 62 (S2), pp. 11-19. DOI: 10.1002/ird.1818

Di Francesco, S., Zarghami, A., Biscarini, C., Manciola, P., *Wall roughness effect in the lattice Boltzmann method* (2013), AIP Conference Proceedings, 1558, pp. 1677-1680. DOI: 10.1063/1.4825852

Biscarini, C., Di Francesco, S., Nardi, F., Manciola, P., *Detailed simulation of complex hydraulic problems with macroscopic and mesoscopic mathematical methods* (2013), Mathematical Problems in Engineering, 2013, art. no. 928309, DOI: 10.1155/2013/928309

Di Francesco, S., Falcucci, G., Biscarini, C., Manciola, P., *LBM method for roughness effect in open channel flows* (2012), AIP Conference Proceedings, 1479 (1), pp. 1777-1779. DOI: 10.1063/1.475652

Biscarini, C., Di Francesco, S., Manciola, P., *CFD modelling approach for dam break flow studies* (2010), Hydrology and Earth System Sciences, 14 (4), pp. 705-718. DOI: 10.5194/hess-14-705-2010

Manciola, P., Di Francesco, S., Biscarini, C., *Flood protection and risk management: The case of Tescio River basin* (2009), IAHS-AISH Publication, 327, pp. 174-183.

Pierleoni, A., Bellezza, M., Casadei, S., Manciola, P., *Multipurpose water use in a system of reservoirs* (2007), IAHS-AISH Publication, (315), pp. 107-116.