PERSONAL INFORMATION

Sauro Manenti

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Documents: 44

Citations: 647

h-index: 14

ACADEMIC POSITIONS

Apr. 2022 – **Associate Professor** of Fluid Mechanics and Continuum Mechanics, Department of Civil Engineering and Architecture – University of Pavia.

Dec. 2014 – Mar. 2022 – **Tenured Assistant Professor** of Fluid Mechanics (and Continuum Mechanics since 2017), Department of Civil Engineering and Architecture – University of Pavia.

Dec. 2011 – Dec. 2014 – **Assistant Professor** of Fluid Mechanics, Department of Civil Engineering and Architecture – University of Pavia.

ACADEMIC CONTRACTS

Nov. 2009 – Oct. 2011 – **Post-doctoral Fellow** at the Department of Civil Engineering and Architecture – University of Pavia

2007 – 2008 – **Adjunct Professor** of Maritime constructions, Faculty of Engineering – University of Rome “Sapienza”.

Sept. 2008 – Feb. 2010 – **Adjunct Professor** of Port and Coastal Engineering, Faculty of Engineering – University of Rome “Sapienza”.

Mar. 2009 – Feb. 2010 – **Adjunct Professor** of Maritime engineering and coast protection, Faculty of Engineering – University of Rome “Sapienza”.

EDUCATION

April 2008 – **Philosophy Doctor** in Hydraulic Engineering, thesis title: “Numerical modelling of water waves and wave-structure interactions in an urbanized lagoon”, Advisor Prof. Alberto Noli. University of Rome “Sapienza”.

July 2004 – Italian engineering professional license, 112/120.

March 2004 – **Master of Science** in Environmental Engineering, thesis title: “Adeguamento strutturale di una vecchia diga in muratura”, 110/110 summa cum laude. Advisors: Prof. Ugo Ravaglioli, Prof. Franco Bontempi. University of Rome “Sapienza”.

RESEARCH INTERESTS

- Development and application of meshless particle method (**SPH)** for the analysis of Newtonian and **non-Newtonian** single- and **multi-phase** rapidly varied free-surface flows with **structure interaction**.
- Numerical modelling of **water related risk** induced by **landslide** and **impulsive wave** (tsunami).
- **Groundwater** flow in unconfined aquifer, **uncertainty quantification** of modelling parameters.

RESEARCH PROJECTS

Dec. 2023 – present	PRIN 2022 PNRR national project “Uncertainty Quantification of coupled models for water flow and contaminant transport” (No. P2022LXLYY), financed by the European Union – Next Generation EU. Coordinator: Dott. L. Tamellini, CNR-IMATI, Pavia.
Aug. 2021 – Jul. 2022	HP10CCMFKT Italian National HPC Research Project - ISCRA-C “High Performance Computing for the SPH simulation of Natural Hazard related to Landslide and Water wave” HPCNHLW3, 64’000 standard hours. Principal Investigator: Prof. S. Manenti, Università degli Studi di Pavia.
Feb. 2020 – Nov. 2022	Call Hub Innovazione e Ricerca of Regione Lombardia CE4WE - Circular Economy for Water and Energy. Coordinator: Prof. A. Di Giulio, Università degli Studi di Pavia.
Nov. 2019 – Aug. 2020	HP10C8P4DP Italian National HPC Research Project - ISCRA-C "High Performance Computing for the SPH analysis of Natural Hazard related to Landslide and Water wave" HPCNHLW2, 150’000 standard hours. Principal Investigator: Prof. S. Manenti, Università degli Studi di Pavia.
Sept. 2019 – Oct. 2020	Analysis and development of reliable and optimized numerical methods to model CO_2 injection and migration in deep geological structures. Funded by ENI. Coordinator: Prof. A. Reali, Università degli Studi di Pavia.
Mar. 2019 – Mar. 2022	MIUR-PRIN 2017 national project "XFAST-SIMS: Extra fast and accurate simulation of complex structural systems" - Prot. 20173C478N. Coordinator Prof. Alessandro Reali, Università degli Studi di Pavia.
Mar. 2019 – Dec. 2019	HP10C4QW9Q Italian National HPC Research Project - ISCRA-C "High Performance Computing for the SPH analysis of Natural Hazard related to Landslide and Water interaction" HPCNHLW1, 360’000 standard hours. Principal Investigator: Prof. S. Manenti, Università degli Studi di Pavia.
May 2018 – Nov. 2020	CARIPLO 2017 national project "ANDROMEDA: A New integrateD hydROgeological Model to assEss landsliDes and flood prone Areas in Oltrepo' Pavese". Coordinator: Prof. C. Meisina, Università degli Studi di Pavia.

CONSULTANT – SCIENTIFIC ACTIVITIES

Dec. 2020 – Mar. 2021	Scientific consultant for Associazione Irrigazione Est Sesia for the numerical modelling of flooding effects in an urban area of Ticino River. Scientific Coordinator: Prof. S. Todeschini, University of Pavia.
Oct. 2018 – Feb. 2019	Experimental and theoretical modeling of “Palmer-Bowlus” flowmeter for SGM Lektra srl (Milan). Scientific Coordinator: Prof. S. Todeschini, University of Pavia.
Feb. 2005 – Feb. 2008	Scientific consultant for Consorzio Venezia Nuova concessionario del Ministero delle Infrastrutture – Magistrato alle Acque di Venezia for the numerical modelling of water waves induced damages on the morphological structures of the Venice Lagoon.

PROGRAMMING – SOFTWARE

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Languages: Fortran, C, Python.

OS: Windows, Unix.

Software: Ansys, Adina, Hec-Ras, Matlab, Modflow, OpenFoam, Paraview, Qgis, Swan.

EDITORIAL – REVIEW ACTIVITIES

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2023	Guest Editor Applied Science – MDPI (ISSN 2076-3417; I.F. 2.7,

https://www.mdpi.com/journal/applsci/special_issues/M08Y5YH2K8). Special Issue: “Computational Fluid Dynamics (CFD) in Environmental Engineering: Methods and Applications”.

2021 Guest Editor Sustainability - MDPI (ISSN 2071-1050; I.F. 3.251, https://www.mdpi.com/journal/sustainability). Special Issue: "Hydrogeological Environment and Water Resources Research".

2019 Guest Editor Mathematical Problems in Engineering - Hindawi (ISSN: 1563-5147; I.F. 1.305). Special Issue: "Computational Methods and Applications to Simulate Water-Related Natural Hazards".

Since 2011 Reviewer for International Journals (reviewerhub.elsevier.com).

TEACHING ACTIVITIES

2024 “Hydraulic modelling for the analysis of weather-related hazard”, Winter School “Social Sciences for Global Challenges”, University of Pavia.

2019 “An introduction to Mechanics of Continua”, 2 CFU. PhD program in Design, Modeling, and Simulation in Engineering, University of Pavia.

2012 - 2015 “Fundamentals of Hydraulics” (Elementi di Idraulica) 6 CFU, University of Pavia (main Lecturer).

SELECTED PUBLICATIONS

Assaf, M.N., Manenti, S., Creaco, E., Giudicianni, C., Tamellini, L., Todeschini, S. New optimization strategies for SWMM modeling of stormwater quality applications in urban area. Journal of Environmental Management, 2024, 361, 121244 (10.1016/j.jenvman.2024.121244).

Bressan, A., Loli, G., Manenti, S., Reali, A., Sangalli, G. An isogeometric shape optimization method for groundwater flow in porous media. Computers and Mathematics with Applications, 2024, 162, pp. 104–119 (10.1016/j.camwa.2024.02.044).

Salis, N., Franci, A., Idelsohn, S., Reali, A., Manenti, S. Lagrangian particle-based simulation of waves: a comparison of SPH and PFEM approaches. Engineering with Computers, 2024, 40(2), pp. 901–915 (10.1007/s00366-023-01831-w).

Salis, N., Hu, X., Luo, M., Reali, A., Manenti, S. 3D SPH analysis of focused waves interacting with a floating structure. Applied Ocean Research, 2024, 144, 103885 (10.1016/j.apor.2024.103885).

Baker, E.A., Manenti, S., Reali, A., Sangalli, G., Tamellini, L., Todeschini, S. Combining noisy well data and expert knowledge in a Bayesian calibration of a flow model under uncertainties: an application to solute transport in the Ticino basin. GEM - International Journal on Geomathematics, 2023, 14(1), 8 (10.1007/s13137-023-00219-8).

Salis, N., Luo, M., Reali, A., Manenti, S. Wave generation and wave–structure impact modelling with WCSPH. Ocean Engineering, 2022, 266, 113228 (10.1016/j.oceaneng.2022.113228).

Cappato, A., Baker, E.A., Reali, A., Todeschini, S., Manenti, S. The role of modeling scheme and model input factors uncertainty in the analysis and mitigation of backwater induced urban flood-risk. Journal of Hydrology, 2022, 614, 128545 (10.1016/j.jhydrol.2022.128545).

Baker, E.A., Cappato, A., Todeschini, S., Tamellini, L., Sangalli, G., Reali, A., Manenti, S. Combining the Morris method and multiple error metrics to assess aquifer characteristics and recharge in the lower Ticino Basin, in Italy. Journal of Hydrology, 2022, 614, 128536 (10.1016/j.jhydrol.2022.128536).

Amicarelli, A., Manenti, S., Paggi, M. SPH Modelling of Dam-break Floods, with Damage Assessment to Electrical Substations. Int. J. of Computational Fluid Dynamics 35:1-2, Pages 3 – 21 2021

(10.1080/10618562.2020.1811240).

Manenti, S., Amicarelli, A., Palazzolo, N., Bordoni, M., Creaco, E., Meisina, C. Post-failure dynamics of rainfall-induced landslide in oltrepò pavese. Water 12:9 September 2020 Article number 2555 (10.3390/w12092555).

Amicarelli, A., Manenti, S., Albano, R., et al. SPHERA v.9.0.0: A Computational Fluid Dynamics research code, based on the Smoothed Particle Hydrodynamics mesh-less method. Computer Physics Communications V. 250, May 2020, Article number 107157 (10.1016/j.cpc.2020.107157).

Todeschini, S., Manenti, S., Creaco, E. Testing an innovative first flush identification methodology against field data from an Italian catchment. Journal of Environmental Management, 2019, 246, pp. 418–425 (10.1016/j.jenvman.2019.06.007).

Manenti, S., Wang, D., Domínguez, J.M., Li, S., Amicarelli, A., Albano, R. SPH modeling of water-related natural hazards. Water (Switzerland), 2019, 11(9), 1875 (10.3390/w11091875).

Manenti, S., Amicarelli, A., Todeschini, S. WCSPH with Limiting Viscosity for Modeling Landslide Hazard at the Slopes of Artificial Reservoir. Water, 10(4), 515 (10.3390/w10040515).

Manenti, S., Pierobon, E., Gallati, M., Sibilla, S., D'Alpaos, L., Macchi, E., Todeschini, S. Vajont Disaster: Smoothed Particle Hydrodynamics Modeling of the Postevent 2D Experiments. Journal of Hydraulic Engineering, 2016, 142(4), 05015007-1 (10.1061/(ASCE)HY.1943-7900.0001111).

Manenti, S., Sibilla, S., Gallati, M., Agate, G., Guandalini, R. SPH Simulation of Sediment Flushing Induced by a Rapid Water Flow. Journal of Hydraulic Engineering, 2012, 138(3), pp. 272–284 (10.1061/(ASCE)HY.1943-7900.0000516).

Di Monaco, A., Manenti, S., Gallati, M., Sibilla, S., Agate, G., Guandalini, R. SPH Modeling of solid boundaries through a semi-analytic approach. Engineering Applications of Computational Fluid Mechanics, 2011, 5(1), pp. 1–15 (10.1080/19942060.2011.11015348).

Petrini, F., Manenti, S., Gkoumas, K., Bontempi, F. Structural Design and Analysis of Offshore Wind Turbines from a System Point of View. Wind Engineering, 2010, 34(1), pp. 85–108 (10.1260/0309-524X.34.1.85).