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RICERCATORE UNIVERSITARIO

Settore: ICAR/01 Idraulica - Settore concorsuale: 08/A1

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Incarichi di insegnamento

- A.A. 2017/2018 Assistant Professor of Continuum Mechanics (6 CFU, taught in English), Master in Civil Engineering for Mitigation of Risk from Natural Hazards - Università degli Studi di Pavia, School of Advanced Studies of Pavia IUSS.
- A.A. 2015/2018 Professore aggregato di Meccanica dei Fluidi (9 CFU), Corso di Laurea in Ingegneria per l'Ambiente e il Territorio - Ingegneria Civile, Facoltà di Ingegneria - Università degli Studi di Pavia.
- A.A. 2012/2015 Professore aggregato di Elementi di Idraulica (6 CFU), Corso di Laurea in Ingegneria Industriale, Facoltà di Ingegneria - Università degli Studi di Pavia.
- A.A. 2008-2009 Docenza a contratto di *Ingegneria Costiera e Portuale*, Facoltà di Ingegneria – Università di Roma “Sapienza”.
- A.A. 2008-2009 Docenza a contratto di *Idraulica Marittima e Protezione delle Coste*, Facoltà di Ingegneria - Università di Roma “Sapienza”.
- A.A. 2007-2008 Docenza a contratto di *Costruzioni Marittime*, Facoltà di Ingegneria - Università di Roma “Sapienza”, sede di Civitavecchia.
- A.A. 2007-2008 Docenza a contratto di *Ingegneria Marittima* - Master in sicurezza ambientale e protezione del mediterraneo, Facoltà di Ingegneria - Università di Roma “Sapienza”.

Attività scientifica e progetti di ricerca

- sviluppatore del codice di calcolo FOSS denominato SPHERA (RSE SpA): Smoothed Particle Hydrodynamics research software; mesh-less Computational Fluid Dynamics code.
- 2017/2018 HPC project proposal: ALTARIS7 - High-resolution simulations for air quality and hydrological risk applications: from the micro- to the global-scale.
- 2016-17 responsabile scientifico dell'attività di ricerca in tema di termo-ablazione dei tumori epatici con la Fondazione CMT onlus.
- 2016/2017 HPC project proposal: NMTFEPRA01 - Numerical Modelling of Turbulent Flows for Environment Protection and Risk Assessment – ISCRA-C competitive call for national HPC research projects.
- 2014 Membro aggregato della commissione Esami di Stato di Ingegneria prima e seconda sessione 2014.
- PRIN 2005. Studio della tecnologia di costruzione delle opere di difesa portuali a parete verticale con l'utilizzo di chiavi di connessione mediante modellazione numerica e fisica delle strutture. Coordinatore Scientifico Prof. Alberto Noli.

Organizzazione convegni e comitati scientifici

- 2012 Associazione AQUALAB, nomina membro del comitato scientifico
- 2012 Membro del National Organizing Committee per la Conferenza Internazionale “IABMAS 2012, 6th International Conference on Bridge Maintenance, Safety and Management”, Villa Erba, Lake Como, Italy, July 8-12, 2012.
- 2010 Membro dello Scientific Committee HANDLING EXCEPTIONS in Structural Engineering, 8-9 July 2010 “Sapienza” University, Rome (Italy).
- 2006 Membro dello Organizing Committee of the 1st SPHERIC Workshop, 10-12 May 2006 “Sapienza” University, Rome (Italy).

Attività di revisione per riviste internazionali

- Journal of Applied Mathematical Modelling - Elsevier ISSN: 0307-904X
- Journal of Fluids and structures - Elsevier ISSN: 0889-9746
- Advances in Water Resources - Elsevier ISSN: 0309-1708
- Journal of Hydraulic Research - Taylor & Francis ISSN: 1814-2079.
- Journal of Hydraulic Engineering - ASCE ISSN: 1943-7900
- International Journal of Computational Fluid Dynamics - Taylor & Francis ISSN: 1061-8562
- Environmental Fluid Mechanics - Springer ISSN: 1573-1510
- International Journal for Numerical Methods in Engineering - Wiley ISSN: 1097-0207
- Computers and Mathematics with Applications - Elsevier ISSN: 0898-1221
- Ocean Engineering – Elsevier ISSN: 0029-8018.
- International Journal for Numerical Methods in Biomedical Engineering – John Wiley & Sons, Ltd. ISSN: 2040-7947.
- Wave Motion – Elsevier ISSN: 0165-2125.
- Journal of Scientific Computing ISSN: 1573-7691.
- International Society of Offshore and Polar Engineers ISOPE

Ambiti di ricerca

Modellazione numerica-sperimentale di sistemi multi-fase

Dinamica impulsiva dei getti di gas inerte iniettati in pressione nei mezzi granulari non-coesivi in ambiente subacqueo.

Modellazione mediante metodologia SPH di:

- flussi multi-fase ad elevata differenza di densità tra le componenti;
- flussi multi-fase viscosi a reologia non-Newtoniana.

Modellazione numerica dei fenomeni di interazione

Analisi mediante metodologia SPH di:

- interazione acqua-sedimenti (erosione) in presenza di strutture idrauliche fondate in alveo e in bacini artificiali;
- dinamica accoppiata delle frane ed onde di tsunami nei bacini artificiali;
- dinamica dei corpi galleggianti soggetti a forzante d'onda.

Modellazione numerica del moto ondoso

Fenomeni di interazione non-lineare delle onde in acqua bassa.

Analisi di rischio del danno indotto dalle onde di vento e natante su strutture artificiali e naturali in ambito costiero.

Ricostruzione del campo d'onda di vento sotto costa attraverso l'uso combinato di modelli atmosferici a meso-scala e modelli spettrali.

Azione delle onde su strutture di supporto per applicazioni in mare aperto (offshore).

Modellazione agli elementi finiti

Analisi termo-elastica in presenza di coazioni termiche e da ritiro in strutture massicce.

Filtrazione nei mezzi porosi.

Publicazioni rilevanti

- 2017 A. Abbà, M. C. Collivignarelli, S. Manenti, R. Pedrazzani, S. Todeschini, G. Bertanza. *Rheology and microbiology of sludge from a thermophilic aerobic membrane reactor (TAMR)*. J. of Chemistry, V. 2017, Article ID 8764510.
- 2017 T. Cazzato, F. Colombo, F. Consolo, A. Redaelli, V. Manzoli, A.A. Tomei, S. Manenti, S. Sibilla. *Multiphase modelling of an experimental device for conformal coating of pancreatic islets*. Proc. 12th Int. Spheric Workshop, Ourense 13-15 June (Spain).
- 2016 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*. J. Hydraul. Eng. V. 142/4, 10.1061/(ASCE)HY.1943-7900.0001111, 05015007.
- 2015 Guandalini R., Agate G., Manenti S., Sibilla S., Gallati M.. *SPH based approach toward the simulation of non-cohesive sediment removal by an innovative technique using a controlled sequence of underwater micro-explosions*. IUTAM Symp. on Particle Meth. in Fl. Mech. Procedia IUTAM V.18, 2015, Pp. 28–39 DOI: 10.1016/j.piutam.2015.11.004.
- 2015 Agate G., Manenti S., Guandalini R., Gallati M., Sibilla S., D'Alpaos L. *3D-SPH advanced modelling of the Vajont landslide*. 10th Int. SPHERIC Workshop - Parma, Italy 16-18 June 2015, pp.224-228 ISBN: 978-88-7847-487-1.
- 2014 Guandalini R., G. Agate, A. Amicarelli, S. Manenti, M. Gallati, S. Sibilla. *SPH modelling of a 3D tsunami test case*. Development and applications of Ocean Engineering 3-1, 11-21. ISSN: 2325-3762
- 2014 Manenti S. *Un modello SPH per flussi multi-fase a superficie libera con forti differenze di densità*. Proc. XXXIV Convegno di Idraulica e Costruzioni Idrauliche, Bari, 18-10 settembre 2014 – Zaccaria Edit. ISBN 978-88-904561-8-3
- 2013 R. Guandalini, G. Agate, S. Manenti, S. Sibilla, M. Gallati. (2013) *Perspectives for SPH Applications on Shock Wave Problems: Basic Modeling and Preliminary Tests*. Frontiers in Geotechnical Engineering (FGE) Vol. 2 Issue 3, pp. 39-46 Sept. 2013 ISSN 2326-5795.
- 2012 S. Manenti, S. Sibilla, M. Gallati, G. Agate, R. Guandalini. *SPH Simulation of Sediment Flushing Induced by a Rapid Water Flow*. J. of Hydr. Eng. Vol. 138, No. 3, pp. 272-284, March 1 ISSN 0733-9429/2012/3-0-0 DOI:10.1061/(ASCE)HY.1943-7900.0000516.
- 2012 Manenti S., Sibilla S., Gallati M., Agate G., Guandalini R. *Experimental and Numerical Modeling of the Impulsive Dynamics of an Underwater non-Cohesive Sediment Deposit subjected to a Gaseous Jet*. 7th Int. SPHERIC Workshop - Prato, Italy 29-31 May, pp.381-385.

- 2012 Agate G., Guandalini R., Manenti S., Sibilla S., Gallati M. *Innovative Numerical Modeling to Investigate Local Scouring Problems Induced by Fluvial Structures*. 6th IABMAS Int. Conf. – Villa Erba, Lake Como, Italy 8-12 July, pp. 229-235.
- 2011 Di Monaco A., Manenti S., Gallati M., Sibilla S., Agate G., Guandalini R. *SPH Modeling of solid boundaries through a semi-analytic approach*. J. Of Eng. Appl. of Comput. Fluid Mechanics Vol. 5, No. 1, pp. 1–15 ISSN 1997-003X.
- 2011 Manenti S., Sibilla S., Gallati M., Agate G., Guandalini R. *SPH modeling of rapid multiphase flows and shock wave propagation*. Proc. COMPDYN 2011 III ECCOMAS Corfu, Greece, 26–28 May ISBN: 978-960-99994-0-3.
- 2010 Petrini F., Manenti S., Gkoumas K., Bontempi F.. *Structural Design and Analysis of Offshore Wind Turbines from a System Point of View*. Wind Eng. Vol 34, N. 1, pp 85–108. ISSN 0309-524X - DOI: 10.1260/0309-524X.34.1.85.
- 2010 Manenti S., Leuzzi G., Monti P., Cerquarelli V. *Wind-Wave Hindcasting on Offshore Wind Turbine through Coupled Atmospheric and Spectral Models*. Proc. ASCE Earth & Space Int. Conf. March 14-17 Honolulu HI. ISBN 978-0-7844-1096-7.
- 2010 Manenti S., Bontempi F., Malerba P.G. *A special kind of analysis: CFD modeling for design and assessment of bridge passive control devices*. Int. Conf. on Bridge Maintenance, Safety and Management July 11-15 Philadelphia, Pennsylvania, USA ISBN: 9780415877862.
- 2010 Dordoni S., Malerba P.G., Sgambi L., Manenti S. *Fuzzy reliability assessment of bridge piers in presence of scouring*. Int. Conf. on Bridge Maintenance, Safety and Management July 11-15 Philadelphia, Pennsylvania, USA. ISBN: 9780415877862.
- 2009 Polnikov V.G., Manenti S. *Study of relative role of nonlinearity and depth refraction in wave spectrum evolution in shallow water*, J. of Eng. Applications of Comput. Fluid Mech. Vol. 3, No. 1, pp. 42–55 ISSN 1997-003X.
- 2008 Manenti S., Panizzo A., Ruol P., Martinelli L. *SPH simulation of a floating body forced by regular waves*, 3rd Int. SPHERic Workshop, 4-6 June, Lausanne (Switzerland), pp. 38-41.
- 2005 Manenti S., Ravaglioli U. *The heightening of an old masonry gravity dam*. Proc. 10th Int. Conf. on Civil, Structural and Environmental Engineering Computing, 30 August-2 September Rome (Italy), Civil-Comp Press; DOI:10.4203/ccp.81.5.

English version

Assistant Professor of Fluid Mechanics, University of Pavia

Education

April 2008 Doctoral Degree Hydraulic Engineering (Ph.D. equivalent). University of Rome “Sapienza”.
Advisor: Prof. Noli A.

March 2004 Degree in Environmental Engineering (110/110 Summa cum Laude). University of Rome “Sapienza”.
Advisors: Prof. Ravaglioli U., Prof. Bontempi F.

Academic Activity

2015-present Assistant Professor of Fluid Mechanics 9 CFU (PG level). Faculty of Engineering, University of Pavia.

2017/2018 Assistant Professor of Continuum Mechanics (6 CFU, taught in English), Master in Civil Engineering for Mitigation of Risk from Natural Hazards - Università degli Studi di Pavia, School of Advanced Studies of Pavia IUSS.

2012-2015 Adjunct Professor of Elements of Hydraulics 6 CFU (UG level). Faculty of Engineering, University of Pavia.

2008-2009 Adjunct Professor of Maritime Constructions. University of Rome “Sapienza”.

2008-2009 Adjunct Professor of Coastal and Port Engineering. University of Rome “Sapienza”.

2008-2009 Adjunct Professor of Coastal Engineering. University of Rome “Sapienza”.

2007-2008 Adjunct Professor of Maritime Constructions. University of Rome “Sapienza”.

2007-2008 Professor of Maritime Engineering, Master in Sicurezza e Protezione del Mediterraneo. University of Rome “Sapienza”.

Scientific Committees

2012 Member of the National Organizing Committee of the IABMAS 2012, 6th International Conference on Bridge Maintenance, Safety and Management, Villa Erba, Lake Como, Italy, July 8-12, 2012.

2010 Member of the scientific committee of the congress Handling Exceptions in Structural Engineering, 8-9 July 2010 “Sapienza” University, Rome (Italy).

2006 Member of the organizing committee of the 1st SPHERIC Workshop, 10-12 May 2006 “Sapienza” University, Rome (Italy).

Invited Lectures

March 2011 SPH modelling applied to sediment scouring. “Ports for Container Ships of Future Generations” Feb. 24 – 25 2011 Hamburg Harburg University of Technology (De).

Nov. 2009 A smoothed particle hydrodynamics: basics and applications. Dip. Structural Mechanics, University of Pavia (Italy).

Research Topics

Interaction Phenomena:

- SPH analysis of landslide dynamics and water generated wave;
- FV - SPH analysis of multiphase flows;
- SPH Dynamic analysis of floating bodies forced by a wave field;
- FE dynamic analysis of the support structure for offshore wind turbines;
- SPH analysis of water-sediment interaction in scouring phenomena.

Numerical Modeling:

- hydrodynamics of multiphase flows;
- rheological modelling of non-Newtonian fluids;
- Non linear wave-wave interactions in shallow water;
- Risk Analysis of wind and vessel generated waves in coastal areas; - Nearshore wave hindcasting through combined atmospheric and spectral models;
- Thermal-elastic analysis of composite structures;
- Filtration in porous media.

Research Projects & Activities:

- developer of the FOSS SPHERA (RSE SpA): Smoothed Particle Hydrodynamics research software; meshless Computational Fluid Dynamics code.
- 2017/2018 HPC project proposal: ALTARIS7 - High-resolution simulations for air quality and hydrological risk applications: from the micro- to the global-scale.
- from 2017 scientific coordinator of the research activity on thermal ablation of hepatic tumor in cooperation with Fondazione CMT onlus.
- 2016/2017 HPC project proposal: NMTFEPRA01 - Numerical Modelling of Turbulent Flows for Environment Protection and Risk Assessment – ISCRA-C competitive call for national HPC research projects.
- 2008 Academic research grant for the development of a meshless particle model to analyse sediment scouring induced by dam bottom outlet; Dipartimento di Ingegneria Idraulica e Ambientale, Engineering Faculty, University of Pavia (Italy).
- 2005 National project PRIN-2005 “Study on the technology of caisson breakwaters interconnected by spanners by means of numerical and physical modelling”. Scientific consultant with academic grant.
- 2005-2008 Scientific research consultant of the “Ministry for Infrastructure - Venice Water Authority – Consorzio Venezia Nuova” for the numerical modelling of the wave induced erosion in the Venice lagoon (Italy).

Referee:

- Journal of Applied Mathematical Modelling - Elsevier ISSN: 0307-904X
- Journal of Fluids and structures - Elsevier ISSN: 0889-9746
- Advances in Water Resources - Elsevier ISSN: 0309-1708
- Journal of Hydraulic Research - Taylor & Francis ISSN: 1814-2079.
- Journal of Hydraulic Engineering - ASCE ISSN: 1943-7900
- International Journal of Computational Fluid Dynamics - Taylor & Francis ISSN: 1061-8562
- Environmental Fluid Mechanics - Springer ISSN: 1573-1510
- International Journal for Numerical Methods in Engineering - Wiley ISSN: 1097-0207
- Computers and Mathematics with Applications - Elsevier ISSN: 0898-1221
- Ocean Engineering – Elsevier ISSN: 0029-8018.
- International Journal for Numerical Methods in Biomedical Engineering – John Wiley & Sons, Ltd. ISSN: 2040-7947.
- Wave Motion – Elsevier ISSN: 0165-2125.
- Journal of Scientific Computing ISSN: 1573-7691.
- International Society of Offshore and Polar Engineers ISOPE