

Diego Avesani, Ph.D.

Curriculum Vitæ

Personal Information

First Name Diego
Surname Avesani

Research Interests

My general research interest covers the areas of **Applied Mathematical Modelling** and **Environmental Fluid Mechanics**. My activity is aimed at understanding and describing complex natural phenomena by combining the development of **mathematical** and **numerical models**.

During my Ph.D., I have developed a innovative **meshfree Lagrangian** scheme based on both SPH and Finite Volume chemotaxis in porous media. Recently, my research activities have moved to **Hydrology** and **Economy** where I am working on the development of a **High Performace Computing** tool for Bayesian approaches.

Teaching

- 2015 - 2016 **Teacher assistant for the course, *Physiological flow and transport in porous tissues***, Trento, Department of Mathematics.
36 frontal hours and project revision
- 2009 - 2019 **Teacher assistant for the course, *Elements of Hydraulics and Hydraulic Constructions***, Trento, Department of Civil Environmental Engineering.
20 frontal hours and project revision

Thesis and Master Thesis co-supervising

- 2016/2017 **Bonazzi Alessandra**, *Sensitivity analysis of oscillatory pumping tests*, university of Trento, Supervisors.
Prof. Bellin Alberto, Prof. Becker Matthew
- 2015/2016 **Maggiorin Mara**, *Are oscillatory pumping tests a suitable tool for characterizing aquifer's heterogeneity?*, University of Trento, Supervisors.
Prof. Tavares Ribeiro Luis Filipe, Prof. Bellin Alberto
- 2014/2015 **Menapace Andrea**, *The direct implementation in epanet 2 source code of uniformly distributed pipe demand to simulate water distribution networks*, University of Trento, Supervisor.
Prof. Righetti Maurizio

Reviewer in the following journals

Advances in Water Research, Journal of Hydrology, Renewable & Sustainable Energy, International Journal for Numerical Methods in Fluids, Journal of Hydraulic Research, Water Resources Management, Water, Processes, Computers and Mathematics with Applications, Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization, Journal of Computational and Applied Mathematics; Hydrological Sciences Journal, Hydrological Sciences Journal

Publications

Peer reviewed journals

D. Avesani, A. Galletti, S. Piccolroaz, A. Bellin, B. Majone, *A dual layer MPI continuous large-scale hydrological model including Human Systems*, Environmental Modelling & Software, 2021, 139, 105003, <https://doi.org/10.1016/j.envsoft.2021.105003>

N. Di Marco, **D. Avesani**, M. Righetti, M. Zaramella, B. Majone and M. Borga. *On the reduction of uncertainty in hydrological modelling by using MODIS snow cover data*, Journal of Hydrology, 2021, 599, 126020, <https://doi.org/10.1016/j.jhydrol.2021.126020>

D. Avesani, M. Dumbser, R. Vacondio, M. Righetti, *An alternative SPH formulation: ADER-WENO-SPH*, Computer Methods in Applied Mechanics and Engineering, 2021,382,112871, <https://doi.org/10.1016/j.cma.2021.113871>

M. Stergiadi, N. Di Marco , **D. Avesani**, M.Righetti , M. Borga *Impact of geology on seasonal hydrological predictability in alpine regions by a sensitivity analysis framework*, Water 2020, 12(8), 2255; <https://doi.org/10.3390/w12082255>

Menapace, A., Zanfei, A., Felicetti, M., **Avesani, D.**, Righetti, M., Gargano, R., *Burst Detection in Water Distribution Systems: The Issue of Dataset Collection*, Appl. Sci. 2020, 10, 8219. doi.org/10.3390/app10228219

Stergiadi, M., Di Marco, N., **Avesani, D.**, Righetti, M., Borga, M., *Impact of Geology on Seasonal Hydrological Predictability in Alpine Regions by a Sensitivity Analysis Framework*, Water 2020, 12, 2255. doi.org/10.3390/w12082255

Di Marco, N., Righetti, M., **Avesani, D.**, Zaramella, M., Notarnicola, C., Borga, M., *Comparison of MODIS and Model-Derived Snow-Covered Areas: Impact of Land Use and Solar Illumination Conditions*, Geosciences 10 (4), 134, 2020. [doi:10.3390/geosciences10040134](https://doi.org/10.3390/geosciences10040134)

Menapace, A., **Avesani, D.** *Global Gradient Algorithm Extension to Distributed Pressure Driven Pipe Demand Model*, Water Resour Manage 33, 1717-1736 (2019). <https://doi.org/10.1007/s11269-018-2174-3>

Menapace, A., **Avesani, D.**, Righetti, M., Bellin, A., Pisaturo, G. *Uniformly Distributed Demand EPANET Extension*, Water Resources Management 32(6):2165-2180, 2018. doi.org/10.1007/s11269-018-1924-6

Avesani, D., Dumbser, M., Chiogna, G., Bellin, A., *An alternative smooth particle hydrodynamics formulation to simulate chemotaxis in porous media*, Journal of Mathematical Biology, 74, 1037-1058 (2017). <https://doi.org/10.1007/s00285-016-1049-6>

Avesani, D., Herrera, P., Chiogna, G., Bellin, A., Dumbser, M. *Smooth Particle Hydrodynamics with nonlinear Moving-Least-Squares WENO reconstruction to model anisotropic dispersion in porous media*, Advances in Water Resources 80, 43-59, 2015. <https://doi.org/10.1016/j.advwatres.2015.03.007>

Avesani, D., Dumbser, M., Bellin, A. *A new class of Moving-Least-Squares WENO-SPH schemes*, Journal of Computational Physics 270, 278-299 (2014). <https://doi.org/10.1016/j.jcp.2014.03.041>

Avesani, D., Righetti, M., Righetti, D., Bertola, P., *The extension of EPANET source code to simulate unsteady flow in water distribution networks with variable head tanks*, Journal of Hydroinformatics 14 (4), 960-973, (2012). [doi: https://doi.org/10.2166/hydro.2012.013](https://doi.org/10.2166/hydro.2012.013)

Others

N. Di Marco, **D. Avesani**, M. Righetti, M. Zaramella, B. Majone and M. Borga, *Parameter uncertainty assessment for a conceptual hydrological model in a snow-dominated catchment combining streamflow records and MODIS snow cover maps*, International Conference on Snow Hydrology Challenges in Mountain Areas - Abstract book, Bozen (Italy): Eurac Research, 2020, p. 53-53. Proceedings of: SnowHydro 2020, Bozen (Italy), 28th - 31st January 2020

M. Stergiadi, M. Righetti, K. Kaffas, **D. Avesani**, M. Zaramella, and M. Borga, *Impact of errors in the initial hydrologic conditions on seasonal hydrological predictions: the role of catchment properties*, Geophysical Research Abstracts Vol. 21, EGU2019-10813, 2019, EGU General Assembly 2019

N. Di Marco, M. Righetti, **D. Avesani**, M. Zaramella, C. Notarnicola and M. Borga, *Evaluating the potential benefit from use of different types of MODIS-based snow cover products on snowmelt runoff modelling using TOPMELT*, Geophysical Research Abstracts Vol. 21, EGU2019-10813, 2019, EGU General Assembly 2019

B. Majone, **D. Avesani**, A. Galletti, and A. Bellin, *HYPERstreamHS: A Dual layer MPI continuous large-scale hydrological Model*, Geophysical Research Abstracts Vol. 21, EGU2019-10813, 2019, EGU General Assembly 2019

A. Galletti, **D. Avesani**, A. Bellin, and B. Majone, *Detailed simulation of storage hydropower systems in a large Alpine watershed*, Geophysical Research Abstracts Vol. 21, EGU2019-10813, 2019, EGU General Assembly 2019

K. Kaffas, M. Righetti, **D. Avesani**, M. Spiliotis, V. Hrisanthou, *Coupling CFSv2 with Arc-SWAT for seasonal hydrological forecasting in a Mediterranean basin*, 11th World Congress on Water Resources and Environment (EWRA 2019) Managing Water Resources for a Sustainable Future Madrid, Spain, 25-29 June 2019

D. Avesani, N. Di Marco, A. Zanfei, F. Ravazzolo, M. Righetti, M. Bruno, *Short term optimization of hydropower production: Toward an innovative hydro-econometric modelling Framework*, IDRA 2020

N. Di Marco, **D. Avesani**, M. Righetti, G. Antonacci, M. Zaramella and M. Borga, *Short-term streamflow forecasts from WRF for hydropower production*, ICEM 2019

A. Galletti, **D. Avesani**, B. Majone, A. Bellin, *Detailed simulation of storage hydropower systems in a large Alpine watershed*, in AGU Fall Meeting 2019, San Francisco: American Geophysical Union, 2019. Proceedings of: AGU Fall Meeting 2019, San Francisco, 9th - 13th December 2019

A Menapace, M Righetti, **D. Avesani**, *Application of Distributed Pressure Driven Modelling in Water Supply System*, in 1st International WDSA / CCWI 2018 Joint Conference, Kingston, Ontario, Canada July 23-25, 2018.

A Menapace, M Righetti, **D. Avesani**, *A new SPH scheme to model transport of chemotactic bacteria in porous media at the continuum scale*, in EGU General Assembly Conference Abstracts 17, 2015.

20-08-2021

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Acconsento alla pubblicazione del mio CV in ottemperanza alle disposizioni di legge dettate in materia di trasparenza (D.Lgs. 33/2013).