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PERSONAL INFORMATION Andrea Menapace

ACADEMIC EXPERIENCE

December 2021–present Assistant professor in Hydraulics (fixed-term RTD-A)

Main tasks Numerical modelling of hydraulic and thermo-hydraulic distribution networks, optimization of hydraulic and energy systems, and data analysis of hydraulic, hydrology and energy problems with statistical and machine learning techniques.

Employer Free University of Bozen-Bolzano, Faculty of Engineering

July 2021–present Co-founder of the spin-off AIAQUA

Main task Partner and CEO until December 2021 of AIAQUA S.r.l.. AIAQUA is an innovative start-up with Free University of Bozen-Bolzano accreditation working in environmental and energy engineering. The main aim is to provide innovative and advanced software tools together with high-level consulting in the field of water distribution systems.

November 2019–December 2021 Research Assistant (Postdoctoral)

Main tasks Developing of hydraulic and thermo-hydraulic numerical models of distribution grids. Heat and drinking water demand modelling with statistic and artificial intelligence algorithms. Analysis of smart grids at urban energy systems level. Sustainable management of hydroelectric production, assessment and mitigation of hydropeaking and flushing impact. Meteo-hydrological modelling for hydroelectric production optimisation.

Employer Free University of Bozen-Bolzano, Faculty of Science and Technology

November 2016–October 2019 PhD Candidate in Sustainable Energy and Technologies

Main tasks Research in the field of energy and water distribution network. Specifically, heat demand analysis, thermo-hydraulic modelling, and optimization procedures of district heating systems in agreement with future sustainable energy challenges.

Employer Free University of Bozen-Bolzano, Faculty of Science and Technology

TEACHING

2023–present Teaching professor in the MSc course *Applied statistics and computer programming for environmental modelling (module A: Applied Statistics & module B: Computer programming)* to Environmental Management of Mountain Areas, Faculty of Science and Technology, Free University of Bozen-Bolzano, Italy, (SECS-S/02 - 3 CFU - 30 hr & INF/01 - 3 CFU - 30 hr).

Teaching professor in the MSc course *District Heating Systems Design* to Energy Engineering, Faculty of Science and Technology, Free University of Bozen-Bolzano, Italy, (ING-IND/10 - 6 CFU - 20 hr).

2022–2023 Teaching professor in the MSc course *Applied statistics and computer programming for environmental modelling (module A: Applied Statistics)* to Environmental Management of Mountain Areas, Faculty of Science and Technology, Free University of Bozen-Bolzano, Italy, (SECS-S/02 - 3 CFU - 30 hr).

Teaching professor in the MSc course *District Heating Systems Design* to Energy Engineering, Faculty of Science and Technology, Free University of Bozen-Bolzano, Italy, (ING-IND/10 - 6 CFU - 20 hr).

Teaching professor in the Master Hyrma (*Sustainable Management of Geo-hydrological Risk in Mountain Environments*) at Faculty of Science and Technology, Free University of Bozen-Bolzano, Italy, (ICAR-02 & AGR/09 - 60 CFU - 18 hr).

Teaching assistant in the Bc course *Econometrics for Economics* and *Econometrics for Finance*, Faculty of Economics and Management, Free University of Bozen-Bolzano, Italy, (SECS-P/05 - 6 CFU - 38 hr).

2021–2022 Teaching professor in the PhD course *Advanced Applications of Fluid Mechanics*, Free University of Bozen-Bolzano, Italy, (ICAR-01 - 9 CFU - 9 hr).

Teaching professor in the MSc course *Applications of fluid mechanics to energy engineering*, Faculty of Science and Technology, Free University of Bozen-Bolzano, Italy, (ICAR-01 - 6 CFU - 18 hr).

Teaching professor in the MSc course *District Heating Systems Design*, Faculty of Science and Technology, Free University of Bozen-Bolzano, Italy, (ING-IND/10 - 6 CFU - 20 hr).

Teaching assistant in the Bc course *Econometrics for Economics* and *Econometrics for Finance*, Faculty of Economics and Management, Free University of Bozen-Bolzano, Italy, (SECS-P/05 - 6 CFU - 38 hr).

2020–2021 Teaching assistant in the Bc course *Econometrics*, Faculty of Economics and Management, Free University of Bozen-Bolzano, Italy, (SECS-P/05 - 6 CFU - 38 hr).

Teaching assistant in the Master Hyrma (*Sustainable Management of Geo-hydrological Risk in Mountain Environments*) at Faculty of Science and Technology, Free University of Bozen-Bolzano, Italy, (ICAR-02 & AGR/09 - 60 CFU - 22 hr).

2019–2020 Teaching assistant in the Bc course *Econometrics for PPE* and *Applied Econometrics*, Faculty of Economics and Management, Free University of Bozen-Bolzano, Italy, (SECS-P/05 - 6 CFU - 38 hr).

2017–2018 Teaching assistant in the MSc course *Acquedotti e Fognature*, Department of Civil, Environmental and Mechanical Engineering, University of Trento, Italy, (ICAR/02 - 6 CFU - 20 hr).

Teaching assistant in the EnvJYobs course (ERASMUS+) *Sustainable Drinking Water Supply Systems*, Department of Civil, Environmental and Mechanical Engineering, University of Trento, Italy, (ICAR/02 - 3 CFU - 10 hr).

2016–2017 Teaching assistant in the MSc course *Progetto di Acquedotti* e Fognature and *Acquedotti e Fognature*, Department of Civil, Environmental and Mechanical Engineering, University of Trento, Italy, (ICAR/02 - 6 CFU - 20 hr).

RESEARCH PROJECTS

TANDEM Hybrid Transient-machine learning approach for ANomaly DEtection and classification in water transmission Mains (2022FR5FB7). AI & Substitute PI. Bando Prin 2022 - Decreto Direttoriale n. 104 del 02-02-2022, 2023-2025. Budget: 206,102 euro (87,686 University of Bolzano unit)

EXTREME Extreme events in mountain environments. Member. Internal funds of the Free University of Bozen-Bolzano (ID call 2022), 2022-2025.

DIADEM Data driven anomaly detection for sustainable water and energy smart grids management. Member. Internal funds of the Free University of Bozen-Bolzano (ID call 2021), 2021-2024.

TESES-Urb Techno-economic methodologies to investigate sustainable energy scenarios at urban level. Member. Internal funds of the Free University of Bozen-Bolzano (ID call 2019), 2019-2022.

SHE Seasonal Hydrological Econometric forecasting for hydropower optimization. Member. Research Autonomous Province of Bozen-Bolzano, 4th call for Research Südtirol/Alto Adige 2019, 2020-2023.

MOIEREF Methods for optimization and integration given energy prices and renewable resources forecasts. Member. Internal funds of the Free University of Bozen-Bolzano, 2017-2020.

EnvYJobs Environmental learning innovation for more knowledge and better jobs. Member. EU-Erasmus+ Project contract N. 2015-1-RO01-KA203-015089, 2015-2018.

CONSULTING AND PROFESSIONAL EXPERIENCE

April 2023–present Rehabilitation of the hydrometric station of San Pietro on the Rio Funes (Qsed Funes). Member. Agentur für Bevölkerungsschutz (APPC) (Autonome Provinz Bozen Südtirol). Free University of Bozen-Bolzano.

2022–present Streamflow forecasting algorithm for hydropower production optimization. Co-founder. ALPERIA S.p.a.. AIAQUA S.r.l..

2022–present Water supply systems renewal planning and management. Co-founder. Laives, Ville d'Anaunia, Predaia Municipalities, and Geas S.p.A.. AIAQUA S.r.l..

2021 Electricity consumption forecasting algorithm. Co-founder. NEOS S.r.l.. AIAQUA S.r.l..

2020–2022 Development of Performance Indicator for water supply systems monitoring. Member. Agenzia provinciale per le risorse idriche e l'energia (APRIE), Province of Trento. Free University of Bozen-Bolzano.

2020 Optimization of the Water Supply System of Laives. Member. Laives Municipality. Free University of Bozen-Bolzano.

2019 Water Supply System modelling and Optimization of Egna. Member. Egna Municipality. Free University of Bozen-Bolzano.

EDUCATION AND TRAINING

November 2016–April 2020 PhD Candidate in Sustainable Energy and Technologies — QEQ 8

At Free University of Bozen-Bolzano, Faculty of Science and Technology

PhD thesis Heat demand and thermo-hydraulic modelling of district heating: implications for urban smart energy systems

Advisor Prof. Ing. Maurizio Righetti

Co-Advisor Prof. F. Marta L. Di Lascio and Prof.Ing. Marco Baratieri

2016 National habilitation to profession of Engineer

"Abilitazione alla professione di Ingegnere", University of Trento.

2013–2016 Master's Degree in Environmental and Land Engineering — QEQ 7

At University of Trento

Master thesis The direct implementation in EPANET 2 source code of uniformly distributed pipe demand to simulate water distribution networks

2006–2013 Bachelor's Degree in Environmental and Land Engineering — QEQ 6

At University of Trento

Bachelor thesis GIS analysis to determine the optimal area for different types of apple trees in Non Valley, using the software GRASS

2001–2006 Hight School Diploma — QEQ 5

At Liceo Scientifico "Bertrand Russell", Cles (TN)

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
German	A2	A2	A2	A2	A2

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

English certificates: English C1 of the CEFR, Free University of Bozen-Bolzano, 8th August 2020. English B2 of the CEFR, ISE 2 EOSOL international,December 2014.

German certificates: Goethe-Zertifikat A2, Goethe Institut, 14th April 2023.

Computer skills

Operating systems: Microsoft Windows, Linux
Programming languages: R, Matlab, Python
Writing software: LaTeX, Microsoft Office
Engineering software: EPANET, QGis, GRASS, EnergyPLAN, Wanda Deltares, HecRas, Autocad, Termis

Driving licence: B

MEMBERSHIPS AND AFFILIATIONS

Memberships

- Member of GII "GRUPPO ITALIANO DI IDRAULICA" (Italian Society of Hydraulics)
- Member of YPN 9-Italy IAHR (Young Professional Network of International Association for Hydro-Environment Engineering and Research)
- Member of CSSI (Centro Studi Sistemi Idrici)

Editorial and Referee activity

Associate Editor:

- Digital Water (Taylor & Francis).

Special Issues Editor:

- Earth and Environmental Sciences: Advanced Applications of Data-Driven Models to Water Resources, 2023-2024. Environmental Sciences (Springer).
- XGBoost Applications to Water Resources Problems, 2023. Water (MDPI).
- Water–Energy Nexus in the Era of Smart Water Revolution and Energy Transition, 2023. Water (MDPI).
- Deep Decarbonization of Energy Systems with Hybrid Renewable Energy Integration, 2022-2023. Energies (MDPI).

Articles Referee (17 journals):

- Applied Energy (Elsevier)
- Axioms (MDPI)
- Electronics (MDPI)
- Frontiers In Sustainable Cities (Frontiers)
- Hydrology and Earth System Sciences (Copernicus GmbH)
- Journal of Water and Climate Change (Wiley)
- Journal of Water Resources Planning and Management (ASCE)
- Mathematical Biosciences and Engineering (Arizona State University)
- Mathematical Problems in Engineering (Hindawi)
- Processes (MDPI)
- Scientific Reports (Nature)
- Sensors (MDPI)
- Smart Energy (Elsevier)
- Sustainability (MDPI)
- Symmetry (MDPI)
- Urban Water Journal (Taylor & Francis)
- Water (MDPI).

Projects Referee (1 project):

- Austrian Climate Research Programme (ACRP), 2023.

Graduate supervision

Students supervised 6 (5 MSc - 1 PhD):

- Benjamin Nimako - PhD thesis in in Sustainable Development and Climate change (SDC): Holistic stochastic approach for sustainable energy transition of alpine cities, 2022-present. Supervisor.
- Andrea Lombardi - MSc thesis in Energy Engineering: Short-term hydrological forecasting for hydroelectric power production in South Tyrol, 2022-present. Supervisor.
- Francesca Peretti - MSc thesis in Energy Engineering: The water-energy nexus in irrigated agriculture: a case study of water distribution system optimisation in South Tyrol, 2021-2022. Supervisor.
- Filippo Morselli - MSc thesis in Energy Engineering: Biomethane Production from Steam-Exploded Green Wastes: Techno-Economic and Environmental Analysis in LIFE STEAM Project, 2021-2022. Co-supervisor.
- Michael Kostner - MSc thesis in Energy Engineering: Dynamic optimisation for PAT implementation and sizing in water supply systems, 2021-2022. Supervisor.
- Francesco Crosina - MSc thesis in Energy Engineering: Advanced modelling of the Renon district heating system: analysis of different scenarios, 2019-2020. Supervisor.

Academic responsibilities

– Member of the Italian Working Group "ponti", Table "Debris flow", (2022-2023).
– Member of the Study Council of the Master Energy Engineering LM-30 and the Master Environmental Management of Mountain Areas LM-73 at the Free University of Bozen/Bolzano.
– Member of Evaluation Commissions at the Faculty of Engineering, Free University of Bozen/Bolzano.
– Member of the Commission for the selection of the XXXVIII cycle of the National PhD in Sustainable Development and Climate Change coordinated by IUSS PAVIA, Italy (2022).
– Member of the organizing committee of the international workshop "Data-driven modelling in water engineering", Free University of Bozen-Bolzano (July 2022).
– Member of the organizing committee of "Live Labs" in the EnvJYobs European project (ERASMUS+), Trento, Italy (2018).

SCIENTIFIC COLLABORATIONS

2023-present Collaboration with Prof. Marco Borga, University of Padova, Department of Land, Environment, Agriculture and Forestry, Italy
- Extreme precipitation analysis and evolution in debris flow occurrence thresholds under climate change scenarios.

2023-present Remote collaboration with Dr. Caterina Capponi, University of Perugia, Department of Civil and Environmental Engineering, Italy
- Transient-machine learning approach for anomaly detection and classification in water transmission mains.

2023-present Remote collaboration with Prof. Silvia Carpitella, California State University, Northridge, Department of Manufacturing Systems Engineering & Management
- Decision making analysis in optimal renewable energy systems modelling.

2022-present Collaboration with Dr. Anton Dignös and Dr. Matteo Ceccarello, Free University of Bozen-Bolzano, Faculty of Engineering, Italy
- ML-enabled data pipeline for anomaly detection in smart distribution systems (DIADEM project).

2021-present Remote collaboration with Prof. Roberta Pappadá, University of Trieste, Department of Economics, Business, Mathematics and Statistics "B. de Finetti"
- Spatial copula-based measure for clustering of panel data.

2021-present Remote collaboration with Prof. Bruno M. Brentan, Federal University of Minas Gerais, Hydraulic Engineering and Water Resources Department, Brazil & Prof. Manuel Herrera, University of Cambridge, Institute for Manufacturing, Department of Engineering, UK
- Water demand forecasting and anomalies detection prediction using machine learning techniques.

2020-present Collaboration with Prof. Bruno Majone, University of Trento, Department of Civil, Environmental and Mechanical Engineering, Italy
- Short and medium term hydrological econometric prediction for hydropower optimization (SHE project).

2020-present Collaboration with Prof. Francesco Ravazzolo, Free University of Bozen-Bolzano, Faculty of Economics and Management, Italy
- Short and medium term econometric modelling and prediction (SHE and TESES-Urb projects).

March–July 2019 Visiting PhD student at Aalborg University, Prof. Henrik Lund and Dr. Jakob Zinck Thellufsen, Department of Sustainable Energy Planning, Aalborg, Denmark
- Analysis of energy system at urban level using EnegyPLAN to investigate the long-term scenarios assessing the District Heating Systems role in the future Sustainable Energy System.

October 2019 Visiting PhD student at Ferrara University, Prof. Walter Boscheri, Department of Mathematics and Computer Science, Ferrara, Italy
- Thermo-hydraulic numerical model for the dynamic simulation of distribution networks.

2017-2019 Remote collaboration with Prof. Rudy Gargano, University of Cassino and Southern Lazio, Department of Civil and Mechanical Engineering, Italy
- Stochastic methodology for district heat load generation and forecasting.

PRIZES AND AWARDS

7th May 2019 **2nd prize of 7th International DHC+ Student Awards**
Realised by DHC+ Technology Platform

Awarded for the work about a stochastic methodology for the characterisation of the district heating load demand of residential buildings in the city of Bozen-Bolzano.

23rd Jun 2017

Best Presentation at VII SEMINARIO GeRI - Management and Rehabilitation of Hydraulic Infrastructure

Realised by CSSI, Centro Studi Sistemi Idrici - University of Cassino and Southern Lazio - University of Perugia

Awarded for the presentation concerning the representation of the hydraulic demand in water distribution system simulations: distributed demand vs concentrated demand.

2016

Winner of the "Premio di merito (Edizione 2016)" for the master thesis in Environmental Engineering

Released by University of Trento.

ADDITIONAL INFORMATION

Publications

- Number of Journal papers: **24**
- Number of Under Review / Submitted Journal papers: **5**
- Number of Proceedings: **33**
- Number of Software: **1**

* Scopus: Publications= 26; h-index= 9; Citations= 183
* Google Scholar: h-index= 10; citations= 273
* Researchgate: Publications= 38; h-index= 10; citations= 267
* Web of Science Researcher (ID AAC-8998-2021): Publications= 23; h-index= 8; Citations= 162
* ORCID: 0000-0003-0778-9721

Updated to 20/08/2023

Conferences

- Number of international conferences and workshops with a given talk: **11**
- Number of national conferences and workshops with a given talk: **4**

Annexes

– Annex 1: list of publications.
– Annex 2: list of attended international conferences and title of associated talk.

ANNEX 1

LIST OF PUBLICATIONS

Journal publications

1. Kostner M., Zanfei A., Alberizzi J.C., Renzi M., Righetti M., and **Menapace A.** (2023). Micro hydro power generation in water distribution networks through the optimal pumps as turbines sizing and control. *Applied Energy*, accepted.
2. Zanfei A., **Menapace A.**, Brentan B.M., Sitzenfrei R., and Herrera M. (2023). Shall we always use hydraulic models? A graph neural network metamodel for water system calibration and uncertainty assessment. *Water Research*, 120264, doi.org/10.1016/j.watres.2023.120264
3. Piraei, R., Niazkar, M., Afzali, S. H., and **Menapace, A.** (2023). Application of Machine Learning Models to Bridge Afflux Estimation. *Water*, 15(12), 2187, doi.org/10.3390/w15122187
4. Dhawan, P., Dalla Torre, D., Zanfei, A., **Menapace, A.**, Larcher, M., and Righetti, M. (2023). Assessment of ERA5-Land Data in Medium-Term Drinking Water Demand Modelling with Deep Learning. Water, 15(8), 1495, doi.org/10.3390/w15081495
5. Zanfei A., **Menapace A.**, Brentan B. M., and Righetti M. (2022). How does missing data imputation affect the forecasting of urban water demand?. *Journal of Water Resources Planning and Management*, 148(11), 04022060, doi.org/10.1061/(ASCE)WR.1943-5452.0001624
6. Zanfei A., Brentan B. M., **Menapace A.**, and Righetti M. (2022). A short-term water demand forecasting model using multivariate long short-term memory with meteorological data. *Journal of Hydroinformatics*, 24(5), 1053-1065, doi.org/10.2166/hydro.2022.055
7. Zanfei A., **Menapace A.**, Brentan B.M., Righetti M., and Herrera M. (2022). Novel approach for burst detection in water distribution systems based on graph neural networks. *Sustainable Cities and Society*, 104090 (86), doi.org/10.1016/j.scs.2022.104090
8. Zanfei A., Brentan B.M., **Menapace A.**, Righetti M., and Herrera M. (2022). Graph convolutional recurrent neural networks for water demand forecasting. *Water Resources Research*, 58 (7), e2022WR032299, doi.org/10.1029/2022WR032299
9. Zanfei A., **Menapace A.**, Granata F., Gargano R., Frisinghelli M., and Righetti M. (2022). An Ensemble Neural Network Model to Forecast Drinking Water Consumption. *Journal of Water Resources Planning and Management*, 148(5), 04022014, doi.org/10.1061/(ASCE)WR.1943-5452.0001540
10. Pisaturo G.R., Folegot S., **Menapace A.**, and Righetti M. (2021). Modelling Fish habitat influenced by sediment flushing operations from an Alpine reservoir. *Ecological Engineering*, 173:106439, doi.org/10.1016/j.ecoleng.2021.106439
11. **Menapace A.**, Santopietro S, Gargano R, Righetti M. (2021). Stochastic Generation of District Heat Load. *Energies*, 14(17):5344, doi.org/10.3390/en14175344
12. **Menapace A.**, Zanfei A., and Righetti M. (2021). Tuning ANN Hyperparameters for Forecasting Drinking Water Demand. *Applied Sciences*, 11(9):4290, doi.org/10.3390/app11094290
13. Di Lascio F. M. L., **Menapace A.**, and Righetti M. (2021). Analysing the relationship between district heating demand and weather conditions through conditional mixture copula. *Environmental and Ecological Statistics*, 28:53-72, doi.org/10.1007/s10651-020-00475-z
14. **Menapace A.**, Zanfei A., Felicetti M., Avesani D., Righetti M., Gargano R.(2020). Burst detection in water distribution systems: the issue of dataset collection. *Applied Sciences, Section: Environmental and Sustainable Science and Technology, Special issue: Emerging Issues of Urban Water Systems Modeling and Analysis* , 10(22):8219, doi.org/10.3390/app10228219
15. **Menapace A.**, Boscheri W., Baratieri M., and Righetti M. (2020). An efficient numerical scheme for the thermo-hydraulic simulations of thermal grid. *International Journal of Heat and Mass Transfer*, 161:120304, doi.org/10.1016/j.ijheatmasstransfer.2020.120304

16. **Menapace A.**, Thellufsen J.Z., Pernigotto G., Roberti F., Gasparella A., Righetti M., Baratieri M., and Lund H. (2020). The design of 100% renewable smart urban energy systems: the case of Bozen-Bolzano. *Energy*, 207:118198, doi.org/10.1016/j.energy.2020.118198

17. Zanfei A., **Menapace A.**, Santopietro S., Righetti M. (2020). Calibration procedure for water distribution systems: comparison among hydraulic models. *Water*, 12(5):1421, doi.org/10.3390/w12051421

18. **Menapace A.**, Righetti M., Santopietro S., Gargano R., and Dalvit G. (2019). Stochastic Characterisation of the District Heating Load Pattern of Residential Buildings. *Euro-Heat and Power (English Edition)*, 16(3-4):14-19

19. **Menapace A.**, Pisaturo G.R., De Luca A., Gerola D., and Righetti M. (2019). EPANET in QGIS framework: the QEPANET plugin. *Journal of Water Supply: Research and Technology-Aqua*, 69(1):1-5, doi.org/10.2166/aqua.2019.087

20. Di Lascio F. M. L., **Menapace A.**, and Righetti M. (2019). Joint and conditional dependence modelling of peak district heating demand and outdoor temperature: a copula-based approach. *Stat Methods Appl*, 29(2):373-395, doi.org/10.1007/s10260-019-00488-4

21. Righetti M., Bort C. M. G., Bottazzi M., **Menapace A.**, and Zanfei, A. (2019). Optimal Selection and Monitoring of Nodes Aimed at Supporting Leakages Identification in WDS. *Water*, 11(3):629, doi.org/10.3390/w11030629

22. **Menapace A.**, and Avesani D. (2019). Global Gradient Algorithm Extension to Distributed Pressure Driven Pipe Demand Model. *Water Resour Manage*, 33(5):1717-1736, doi.org/10.1007/s11269-018-2174-3

23. Pisaturo G.R., Righetti M., Castellana C., Larcher M., **Menapace A.**, and Premstaller, G. (2019). A procedure for human safety assessment during hydropeaking events. *Science of The Total Environment*, 661:294-305, doi.org/10.1016/j.scitotenv.2019.01.158

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

Proceedings

1. Kostner M., Zanfei A., **Menapace A.**, Alberizzi J.C., Renzi M., Larcher M., and Righetti M. (2023). Digitisation for Sustainable Water Supply Systems: The Case of Optimal Pressure Management. *International Symposium on Industrial Engineering and Automation (ISIEA)*, Bolzano, Italy. Cham: Springer Nature Switzerland, p. 579-589, doi.org/10.1007/978-3-031-38274-1_48

2. **Menapace A.**, Dhawan P., Dalla Torre D., Larcher M., and Righetti, M. (2023). Analysis of the statistical bias correction of ERA5-Land on different time aggregations in Trentino-Alto Adige. *Copernicus Meetings*, No. EGU23-15537, doi.org/10.5194/egusphere-egu23-15537

3. Dalla Torre D., **Menapace A.**, Zanfei A., and Righetti, M. (2023). Data-driven streamflow forecasting analysis leveraging multiple meteorological providers. *Copernicus Meetings*, No. EGU23-11347, doi.org/10.5194/egusphere-egu23-11347

4. Dhawan P., Dalla Torre D., **Menapace A.**, Majone B., and Righetti M. (2023). High-resolution gridded dataset of precipitation and temperature for Trentino-Alto Adige. *Copernicus Meetings*, No. EGU23-11499, doi.org/10.5194/egusphere-egu23-11499

5. Brentan B., Carpitella S., Zanfei A., Souza R. G., **Menapace A.**, Meirelles G., and Izquierdo Sebastián J. (2022). Optimizing of rehabilitation alternatives for large intermittent water distribution systems. *Modelling for Engineering & Human Behaviour 2022*, 139-142.

6. Zanfei A., **Menapace A.**, Frisingelli M., and Righetti M. (2022). Quanto influisce la scelta degli input nella previsione della domanda idrica con reti neurali ricorrenti? Un caso studio *XXXVIII Convegno Nazionale di Idraulica e Costruzioni Idrauliche*, p. 1-4. Reggio Calabria, Italy

7. Di Lascio F.M.L., **Menapace A.** and Pappadá R. (2022). AMH copula-based clustering of variables in panel data with application to district heating demand. *ECDA 2022 Conference*, Naples, Italy

8. Brentan B., Zanfei A., Souza R.G., **Menapace A.**, Meirelles G., Montalvo I., Righetti M., and Izquierdo J. (2022). Optimal rehabilitation procedure for intermittent water supply systems. *Book of Short Papers of the 2st International WDSA-CCWI Joint Conference*, Valencia, Spain

9. Zanfei A., **Menapace A.**, and Righetti M. (2022). An artificial intelligence approach for managing water demand in water supply systems. *14th International Conference on Hydroinformatics HIC*, Bucharest, Romania. *IOP Conf. Ser.: Earth Environ. Sci.*, 1136:012004, doi.org/10.1088/1755-1315/1136/1/012004

10. **Menapace A.**, Dalla Torre D., Zanfei A, Dhawan P., Larcher M., and Righetti M. (2022). Assessment of the short-term streamflow forecasting using machine learning fed by Deutscher Wetterdienst ICON climate forecasting model. *39th World Congress of IAHR*, Granada, Spain, ISSN: 2521-7119, doi://10.3850/IAHR-39WC2521716X20221774

11. Zanfei A., **Menapace A.**, Brentan B., and Righetti M. (2022). Predicting water demand of water supply systems in the alpine environment with recurrent neural networks. *39th World Congress of IAHR*, Granada, Spain, ISSN: 2521-7119, doi://10.3850/IAHR-39WC2521716X20221774

12. Dalla Torre D., **Menapace A.**, and Righetti M. (2022). Hydrological performance analysis in Alpine environment leveraging Deutscher Wetterdienst ICON meteorological forecasting model as data set. *39th World Congress of IAHR*, Granada, Spain, ISSN: 2521-711, doi://10.3850/IAHR-39WC2521716X20221774

13. Pisaturo G.R., **Menapace A.**, Folegot S., and Righetti M. (2022). Fish habitat modelling considering sediment flushing operations. *39th World Congress of IAHR*, Granada, Spain, ISSN: 2521-711, doi://10.3850/IAHR-39WC2521716X20221

14. **Menapace A.**, Zanfei A., De Luca A., Di Pauli D., and Righetti M. (2022). Towards a Digital Twin Model for the Management of the Laives Aqueduct. *5th International Conference EWAS5*, Naples, Italy. Environ. Sci. Proc. 21(1), 70. doi.org/10.3390/environsciproc2022021070.

15. Dalla Torre D., **Menapace A.**, Zanfei A., and Righetti M. (2022). Assessmentof a short-term machine learning streamflow forecasting in small Alpine catchments leveraging Deutscher Wetterdienst ICON climate forecasting model. *EGU22*, Vienna, Austria

16. Di Lascio F.M.L., **Menapace A.**, and Pappadá R. (2021). Ali-Mikhail-Haq copula to detect low correlations in hierarchical clustering. *Book of abstract and short papers of the 13th Scientific Meeting Classification and Data Analysis Group*, 128:324-327, doi.org/10.36253/978-88-5518-340-6, Firenze, Italy

17. **Menapace A.**, Zanfei A., Santopietro S., Pisaturo G.R., and Righetti M. (2021). Il ruolo della modellazione idraulica nel problema mal posto della calibrazione delle reti idriche. *XXXVII Convegno Nazionale di Idraulica e Costruzioni Idrauliche*, p. 1-4. Reggio Calabria, Italy

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Software

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ANNEX 2

LIST OF TALKS AT INTERNATIONAL AND NATIONAL CONFERENCES

1. Oral presentation at international conference: Digitisation for sustainable water supply systems: the case of optimal pressure management. *2nd International Symposium on Industrial Engineering and Automation ISIEA 2023*, Bozen-Bolzano, Italy. June - 22nd-23rd 2023

2. Poster presentation at international conference: Analysis of the statistical bias correction of ERA5-Land on different time aggregations in Trentino-Alto Adige. *EGU General Assembly 2023*. Vienna, Austria & Online. April 23rd–28th 2023

3. Oral presentation at international workshop: Modelling and simulation of hydraulic distribution networks. *2nd Workshop on the use of Numerical Analysis in Engineering*. Bozen-Bolzano, Italy. March 15th 2023

4. Oral presentation at international workshop: Short-term streamflow forecasting with SVR model in a small Alpine catchment. *Data-driven modelling in water engineering*. Bozen-Bolzano, Italy. July 12th 2022

5. Oral presentation at international conference: An Artificial Intelligence Approach for Managing Water Demand of Water Supply Systems. *14th International Conference on Hydroinformatics (HIC 2022)*. Bucharest, Romania. July 4th-8th 2022

6. Oral presentation at international conference: Assessment of the Short-Term Streamflow Forecasting Using Machine Learning Fed by Deutscher Wetterdienst ICON Climate Forecasting Model. *39th IAHR World Congress*. Granada, Spain. June 19th-24th 2022

7. Oral presentation at international conference: Day-ahead streamflow forecasting for optimal hydropower plants production. *DATA ANALYTICS FOR BUSINESS*. Verona, Italy. May 24th-25th 2022

8. Oral presentation at national conference: Il ruolo della modellazione idraulica nel problema mal posto della calibrazione delle reti idriche. *XXXVII Convegno Nazionale di Idraulica e Costruzioni Idrauliche*. Reggio Calabria, Italy. June 14th-16th 2021

9. Oral presentation at international conference: A flexible methodology to analyse 100% renewable energy cities. *6th International Conference on Smart Energy Systems*. Aalborg, Denmark. October 6th-7th 2020

10. Oral presentation at national workshop: QEPANET: un tool per la modellazione di reti acquedottistiche in ambiente QGIS. *VIII Seminario Tecnologie e Strumenti Innovativi per le Infrastrutture Idrauliche (TeSI)*. Napoli, Italy. July 8th-9th 2019

11. Oral presentation at international conference: Stochastic characterisation of the district heating load pattern of residential buildings. *39th Euroheat & Power Congress* . Nantes, France. May 6th-8th 2019

12. Invited talk at international conference: A copula-based modelling of peak district heating demand and outdoor temperature. *The Joint 12th International Conference on Computational and Financial Econometrics (CFE 2018) & the 11th International Conference of the ERCIM (European Research Consortium for Informatics and Mathematics) Working Group on Computational and Methodological Statistics (CMStatistics 2018)*. Pisa, Italy. December 14th-16th 2018

13. Oral presentation at national conference: Distributed pressure driven demand approach in water distribution system. *XXXVI Convegno Nazionale di Idraulica e Costruzioni Idrauliche*. Ancona, Italy. September 12th-14th 2018

14. Oral presentation at international conference: Application of Distributed pressure driven modelling in water supply system. *1st International WDSA-CCWI Joint Conference*. Kingston, Ontario, Canada. July 23th-25th 2018

15. Oral presentation at national conference: Domanda idrica distribuita versus concentrata. *VII Seminario GeRI - Management and rehabilitation of the hydraulic infrastructure*. Gaeta, Italy. June 22th-23th 2017