



The **Hydroinformatic group** is part of [Technical University of Bari \(Politecnico di Bari\)](#), which is one of the three Technical Universities in Italy, with more than 50-years tradition in the field of civil engineering. Technical University of Bari is based in Bari and Taranto, in South-East of Italy and is constituted by three Faculties: Engineering Faculty of Bari, Engineering Faculty of Taranto and the Faculty of Architecture. It has also several Departments concerned with civil, environmental, industrial and information engineering.

Since 2004 the **Hydroinformatic group** has gained expertise in data-driven modelling, multi-objective analysis, decision support, water system design, management and rehabilitation, even through very strong links with both national/international institutional and private industrial partners.

The leader of the Hydroinformatic group is [Prof. Orazio Giustolisi](#). The group is based in the Department of Civil and Environmental Engineering (DICA). The team is made up of seven people: three academics, three post-doctorals and one PhD student. In particular, the group has developed evolutionary techniques for modelling environmental phenomena (groundwater, river water temperature, rainfall-runoff, etc.), evolutionary optimization techniques for the automatic design of water systems under uncertain scenarios, uncertainty analysis for water systems, optimized approach on the development of decision support systems for the management of water distribution systems (rehabilitation, pressure optimization, water quality, leakage control, etc.).

The group produces 15-20 international publications per year and it is involved in a relevant international activity that is demonstrated by continuous reviewing for the following international journals as Hydrological Science Journal (IAHS), Water Management Journal (ICE), Journal of Hydroinformatics (IWA-IAHR), Hydrological Processes (Wiley), Journal of Water Resources Planning and Management (ASCE), Journal of Hydraulic Engineering (ASCE).

The group has a number of international and national links with academic partners, in particular a formal agreement of cooperation exists between the group and the Centre for Water Systems

in the University of Exeter (UK). Both the research groups have been working on common topics related to water distribution systems in the last 5 years. Another important link is with the University of Ferrara, in particular with the group led by Prof. Marco Franchini in the Department of Engineering.

The group has developed in the last year toolboxes and algorithms, in particular: Evolutionary Polynomial Regression ([EPR](#)); Input-Output Artificial Neural Networks (IODNN); Water distribution network structural design/rehabilitation and reliability analysis (WDSTOOL); Multi-objective and Single-objective Genetic Algorithms ([OPTIM](#)); [OGA](#)); Automatic Design of Input-Output Artificial Neural Networks ([ANNs](#)); [MOGA](#)); Automatic Design of Support Vector Machines (MO-SVM).

Moreover the group is/was involved in the following granted Research Projects:

- ["Advanced techniques for efficiency, reliability and safety of water distribution networks" - PRIN 2008- Project leader: Prof. Marco Franchini \(University of Ferrara, Italy\);](#)
- "Intercultural landscapes. Methodologies for comparative analysis. Urban layouts and building features of the transboundary adriatic context" - PRIN 2008;
- "Innovative Systems and the Boundary Problem (ISBP)" – STREP under NEST Pathfinder, Cultural Dynamics [Nest-2005-Path-4];
- ["Multi-objective evolutionary optimization and data-driven techniques for water system management" – Internationalization of the Italian University system: Interlink – MIUR](#) ;
- "Optimization of information-intensive processes: applications to the ICT and environment sectors" – Regione Puglia, Progetti Esplorativi;
- UKWIR: guide research on "Modelling Performance Indicators for Sewer systems using Evolutionary Computing" jointly with Ewan Group Ltd. Anglian Water (UK): Performance modelling of wastewater assets. Anglian Water (UK): Performance modelling of clean water assets.
- RPS (UK): Natural leakage rate modelling using EPR.

The Staff Members of the group in the Technical University of Bari are: [Prof. Orazio Giustolisi](#) ; [Prof. Michele Mastrorilli](#)

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