ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
ΠΟΛΥΤΕΧΝΙΚΗ ΣΧΟΛΗ - ΤΜΗΜΑ ΠΟΛΙΤΙΚΩΝ ΜΗΧΑΝΙΚΩΝ

ΣΕΙΡΑ ΕΠΙΣΤΗΜΟΝΙΚΩΝ ΔΙΑΛΕΞΕΩΝ
ΑΚΑΔΗΜΑΙΚΟΥ ΕΤΟΥΣ 2018-2019

Divide and Conquer: Water network partitioning of Smart Water Networks

Armando Di Nardo
Associate professor, PhD
Coordinator of European IP Water Action Group CTRL+SmartWaterNetwork
Department of Engineering (Università della Campania Luigi Vanvitelli)
Istituto Sistemi Complessi (Consiglio Nazionale delle Ricerche)

Wednesday **26/09/2018**, time **14:00pm**
Room **A2**, Department of Civil Engineering

Abstract: The recent development of ICT (Information & Communication Technology) allowed to transfer some innovations also to water networks contributing to develop the new era of Smart Water Networks. In particular, the possibility of inserting remote control valves and flow meters in Water Distribution Systems (WDS) allows the implementation of the paradigm of "divide and conquer", that consists into divide a large water network into k smaller subsystems, in order to simplify and improve the management of water supply system. Indeed, the partitioning of the network into hydraulically independent subsystems or districts, called District Meter Areas (DMA), can significantly help the operators for water loss detection and pressure management and for water safety of WDS. When DMAs are permanent, the technique is called Water Network Partitioning (WNP). Traditionally, the WNP is based on empirical and 'trial and error' approaches used with hydraulic simulation, which are difficult to apply to large water networks because the insertion of gate valves reduces the hydraulic performance of network increasing significantly energy losses. Recently some heuristic procedures, based on different techniques (graph theory, spectral clustering, recursive and multiagent approaches, etc.) showed that is possible to find automatically optimal solutions. The lecture will show that advantages of the application of the paradigm of divide and conquer and some recent procedures to obtain optimal water network partitioning of Smart Water Networks.