

# PhD In Information Technology

**Research Area n. 3 Title: Systems and control**

**Research Field: Drought management and control in complex transboundary water resources systems**

<b>Scholarships and Financial support</b>	
Monthly net income of PhD scholarship (max 36 months)	€. 1.200 (In case of a change of the welfare rates during the three-year period, the amount could be slightly modified)
Number of scholarships	1
Beginning of PhD	1/5/2017
Deadline for application	13/03/2017
<b>Context of the research activity</b>	
Motivations and objectives of the research in this field	Transboundary water resources systems often embody multiple conflicting users diversely sensitive to hydro-meteorological extremes (i.e. droughts and/or floods). Designing the short term control and long term strategic operations of these systems accounting for undergoing climate and socio-economic change might substantially benefit from the availability of anticipated information on the occurrence/intensity of such extremes across different time scales. The research will focus on the development of innovative control and optimization approaches for the robust control of large scale transboundary water systems incorporating exogenous information – in the form on ENSO indicators, drought indicators, streamflow long term prediction.
Methods and techniques that will be developed and used to carry out the research	Control and optimization algorithms to solve multiobjective and robust real time control problem under risk and uncertainty using exogenous information and predictions. Approaches to identify the value of information to decision making.

Educational objectives	The doctoral program offers advanced training in the research topics currently explored by the scientific community in academy and industry. A period of study in worldwide most recognized research institutions is supported by the doctoral school and the supervisor. <a href="http://dottoratoit.deib.polimi.it/">http://dottoratoit.deib.polimi.it/</a>
Job opportunities	The PhD graduates have opportunities both in academy and industry. The intensive collaboration with industrial partners allowed several past PhD graduates to find a satisfactory job position in private companies. Job opportunities abroad are also frequently offered.
Composition of the research group	The research will be developed within the Environmental Systems Group (ESG) at the Department of Electronics, Information, and Bioengineering at Politecnico di Milano. ESG includes 4 full professors, 1 associate professors, 3 assistant professor, and more than 15 among PhDs, post-docs and research associates. TheE AIG
Names of the research directors	Andrea Castelletti (Politecnico di Milano)
E-mail address, phone number and web-page	<a href="mailto:andrea.castelletti@polimi.it">andrea.castelletti@polimi.it</a> , +390223993584, <a href="http://www.nrm.deib.polimi.it/">http://www.nrm.deib.polimi.it/</a>
List of 5 Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research	<ol style="list-style-type: none"> <li>1. ETH Zurich</li> <li>2. University of Wisconsin Madison</li> <li>3. Cornell University</li> </ol>
<b>Additional support</b>	
<u>Educational activities</u> (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences): financial aid per PhD student per year	2nd year: 1.370 euro per student 3rd year: 1.370 euro per student
<u>Teaching assistantship:</u> availability of funding in recognition of support to teaching activities by the PhD student	There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.
<u>Computer availability:</u>	1 <sup>st</sup> year: <i>individual use</i> 2 <sup>nd</sup> year: <i>individual use</i> 3 <sup>rd</sup> year: <i>individual use</i>
<u>Desk availability:</u>	1 <sup>st</sup> year: <i>individual use</i> 2 <sup>nd</sup> year: <i>individual use</i> 3 <sup>rd</sup> year: <i>individual use</i>