POLITECNICO DI MILANO

PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 41st cycle

Research Area n. 3 - Systems and Control

THEMATIC Research Field: INVERSE REINFORCEMENT LEARNING FOR MODELING HUMAN DECISIONS IN WATER RESERVOIR SYSTEMS

Monthly net income of PhDscholarship (max 36 months)
1600.0
In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
Motivation and objectives of the research in this field	In a changing climate and society, the importance of cross-sector interactions becomes crucial for understanding the co-evolution of human and natural systems, where the role of individual and collective human decisions is a major driver of system vulnerabilities and adaptive capacity. While mathematical models of natural processes have been studied and developed for centuries and, today, they are extremely sophisticated at fine spatial and temporal scales, there is an urgent need to shed light on the key role of human behaviors across multisector systems.The research will aim at developing Inverse Reinforcement Learning algorithms to model observed human decisions related to the operations of water reservoir systems. The position is cofounded by the Fondo Italiano per la Scienza (FIS2) project BERLIN – BEhavioRaL INTelligence for evidence-based adaptation policies.
Methods and techniques that will be developed and used to carry out the research	State of the art Inverse Reinforcement Learning algorithms will be used together with Reinforcement Learning and optimal control methods. Big data, statistics, and Machine Learning will be leveraged to manipulate and examine the large set of observation and model simulations.

Educational objectives	The PhD teaching program consists of classroom courses and independent study, both aimed at developing advanced research skills and competence on innovative topics. Advanced courses offered by the professors at DEIB bring the attendants to the frontiers of knowledge in those sectors where DEIB's research is most active. Other courses, aimed at the development of more general skills (e.g., soft skills), are offered by the PhD School of the Politecnico di Milano. The participation to national and international summer schools is also encouraged.
Job opportunities	Holders of a PhD degree in Information Technology have access to positions at the highest levels of scientific research in IT and related areas. Depending on their interests and ambitions, PhD's may decide to move towards an academic or industrial career, either in Italy or abroad.
Composition of the research group	1 Full Professors 1 Associated Professors 6 Assistant Professors 10 PhD Students
Name of the research directors	Prof. Matteo Giuliani

Contacts
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

Scholarship Increase for a period abroad

Amount monthly	800.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
EDUCATIONAL ACTIVITIES (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences).   TEACHING ASSISTANTSHIP: availability of funding in recognition of supporting 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.   COMPUTER AVAILABILITY: 1st year: Yes   2nd year: Yes   3rd year: Yes   Environmental Intelligence for Global Change Lab