Open invited track

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"Control and estimation problems in water systems"

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Abstract:
This open invited track is proposed for inclusion in the IFAC world congress 2020 to be held in Berlin, Germany, July 12-17th, 2020. It invites contributions in modeling, control and estimation of different water systems and aims at presenting the current advances in this area as well as discussing the challenges and solutions to respond to the increasing water demand. Water systems are complex and offer several research opportunities for the control community to develop new and effective control, supervision and monitoring systems that respond to specific challenges such as the effective water resources distribution, the smart water irrigation, the optimal and cost-effective water desalination and the smart waste water treatment monitoring.

Description:

Water is essential for life, well-being and for our development. However, fresh water only accounts for 2.5% of Earth's water body, with most of it inaccessible in the form of glaciers, snow, and ice. The rapid population growth around the world has increased the demand for fresh water, putting the already limited natural freshwater resources under great pressure. To respond to the growing water demand, many countries heavily rely on alternative solutions, such as water desalination or waste water treatment. In addition, an effective management of the water resources will help to fairly distribute the water. Therefore, smart water systems have emerged offering new efficient and green solutions for water supply, water distribution, allowing an optimal system operation and monitoring, and at the same time reducing the cost and effect on the environment.

The objective of this track is to bring together researchers in modeling, control and estimation and also engineers to interact and discuss challenges and also solutions around water scarcity in several regions in the world including regions with arid climate and islands. Examples of topics that will be covered include, but are not restricted to, control and monitoring of desalination systems, control and smart sensing of waste water treatment systems, efficient irrigation and drainage systems and management of water resources. These topics provide a good opportunity to the control community to contribute and enhance such systems. It also offers challenging and complex problems that generate interesting and exciting research topics around control and estimation for linear and nonlinear differential equations, differential algebraic equations and partial differential equations.

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