CALL FOR PAPERS

Mathematics of Control, Signals, and Systems

MCSS special issue on

Control, Communication, and Complexity

Aims and scope of the special issue Communication for control involves an interplay between information transmission via digital communication channels and control of dynamical systems in real time. The problem of synthesizing and analyzing decentralized control and communication subsystems subject to delays and bandwidth constraints poses great challenges which have not yet been resolved in a satisfactory way. While the need for developing such a theory has been realized almost twenty years ago, only recently have the contours of emerging theories become visible. One line of research concerns the relations between control performance and communication performance, where the information patterns play a decisive role in the overall systems design. The development here is driven by applications such as control over the internet and wireless networks, and in general control over limited bandwidth feedback. The communication complexity comes to the foreground when one studies control system dynamics wherein multiple agents collaboratively provide inputs to a control system in order to achieve a common objective that no single agent could achieve alone. For hybrid systems containing continuous and discrete time elements, computability problems, in particular, for reachability, are of primary importance.
The emerging theories will yield a fusion of concepts and methods from control, communication and (theoretical) computer science and the proposed special issue will provide a broad view on recent developments of the subject.

The journal *Mathematics of Control, Signals, and Systems* (MCSS) is soliciting papers for a special issue on this important subject. The aim of this special issue is to collect the latest theoretical achievements, highlight contemporary applications in this area as well as to provide surveys about the current state of the art to motivate and enable readers, in particular younger graduates, to join this research direction. Original and high-quality papers are invited which involve at least two aspects in the intersection of control, communication and complexity.

Topics of interest for this special issue include, but are not limited to

- Communication for achieving control objectives
- Entropy and topological dynamics in control
- Control, communication, and complexity of distributed systems
- Directed information flow for control/communication networks
- Computability for hybrid and complex systems

Submission details All manuscripts must be submitted via the "Editorial Manager" (EM) system of MCSS at `http://www.editorialmanager.com/mcss`. When submitting a manuscript for this special issue via EM, please select the entry "Special issue on control, communication, and complexity" from the article type menu in order for the manuscript to be considered for this special issue.
All papers will be reviewed by at least two reviewers and may be sent back to the authors for a revision that should be completed within at most one month. The final publication decision based on the recommendations of the guest editors will be taken by the Editors-in-Chief. The editorial policy of MCSS is to *publish original and high-quality research papers concerned with mathematically rigorous system theoretic aspects of control and signal processing* (see the journal home page). Please note that the two criteria *high-quality* and *mathematically rigorous* are taken very seriously and are not at the discretion of the guest editors. Due to volume size limitation, some accepted papers may be recommended to be published as regular papers in MCSS.

Important dates

Deadline for the initial submission of manuscripts . . . . . May 1, 2012
Notification about the first decision . . . . . September 1, 2012
Revised manuscripts due . . . . . October 1, 2012
Notification about final acceptance decision . . . . . November 1, 2012
Publication of the special issue . . . . . Early 2013

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