

CALL FOR PAPERS

IEEE SIGNAL PROCESSING MAGAZINE

Special Issue on Game Theory in Signal Processing and Communications

Game theory is a branch of mathematics aimed at the modeling and understanding of resource conflict problems. Essentially the theory splits into two branches, noncooperative and cooperative game theory where the distinction between the two is whether the players in the game can make joint decisions regarding the choice of strategy. Noncooperative game theory is closely connected to minimax optimization, and typically results in the study of various equilibria, most notably the Nash equilibrium. Cooperative game theory examines how strictly rational (selfish) actors can benefit from voluntary cooperation by reaching bargaining agreements. Another distinction is between static and dynamic game theory, where the latter can be viewed as a combination of game theory and optimal control.

Game theory provides a structured approach to many important problems arising in signal processing and communications, e.g. resource allocation and robust transceiver optimization. Recent applications occur also in other emerging fields, e.g. cognitive radio, spectrum sharing, and in multi-hop sensor and ad-hoc networks.

This special issue aims at promoting the use of game theory to the signal processing community. The motivation for this is that successful application of game theory has arisen in an increasing number of fields of engineering, and notably in areas related to information and communication technologies. Examples of this are game-theoretic criteria for scheduling processes in multi-processor computing machines, or for distributing bandwidth and/or transmission power in wireless packet communication networks.

The intention with this special issue is to attract tutorial-style papers on game theory with applications in all fields of signal processing. Possible topical areas include, but are not limited to, the following topics.

Scope of topics:

- Static noncooperative games (Nash and Stackelberg equilibria)
- Cooperative (axiomatic bargaining) game theory
- Auction theory, coalitions, and pricing
- Finite and infinite dynamic games
- Stochastic and repeated games
- Games with imperfect and asymmetric information
- Game theory for resource allocation in communications
- Game theory for adaptive waveform design
- Game theory for cognitive radio and spectrum sharing
- Worst-case system design based on minimax formulations
- Development of decentralized algorithms using game theory
- Source rate compression based on game theory

Submission Procedure:

Prospective authors should submit white papers to the web submission system at <http://www.ee.columbia.edu/spm/> according to the following timetable. White papers, limited to 6 single-column double-spaced pages, should summarize the motivation, the significance of the topic, a brief history, and an outline of the content.

Schedule (all deadlines are firm no exceptions)

White paper due:	October 15, 2008
Invitation notification:	November 1, 2008
Manuscript due:	February 1, 2009
Acceptance Notification:	May 1, 2009
Final Manuscript due:	May 15, 2009

Publication date: September, 2009

Guest Editors:

Eduard A. Jorswieck

Dresden University of Technology, Germany
jorswieck@ifn.et.tu-dresden.de

Erik G. Larsson

Linköping University, Sweden
erik.larsson@isy.liu.se

Marco Luise

University of Pisa, Italy
marco.luise@iet.unipi.it

H. Vincent Poor

Princeton University, USA
poor@Princeton.edu