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Complex Self-Interested Networks (CSIN) are those complex networks where there is a social goal or desired behavior, for the network as a whole and where there are autonomous elements (agents) with individual goals, usually in conflict with the social goal or among themselves. These systems arise in a great number of real-world problems, for example, transportation infrastructures or electric grids.

The problem of achieving efficient behaviors in these systems, in terms of both social and individual goals, is called CSIN behavior optimization. This problem originates from the fact that these systems involve autonomous, self-interested entities (e.g., drivers), which usually deviate from socially-optimal behavior, leading to problems related to availability and inefficient use of resources, such as severe traffic jams or blackouts. Typically, managing these systems involves making trade-offs between the conflicting goals of the different agents in the network. In a traffic management scenario, for instance, most users have similar goals (arrive at their destinations as soon as possible), but the resource limitations (e.g., road capacity) raises the need for coordination to mitigate congestion and its impact on travel times, gas consumption and CO₂ emissions.

The relevance for everyday life of these systems, together with their pervasiveness, makes the behavior optimization in complex self-interested networks of great interest. The most relevant challenges in CSIN optimization are the large scale of the problem, the inherent existence of interdependencies between linked nodes, and the presence of self-interested elements in the system. Thus, natural approaches to face CSIN optimization are, among others, genetic algorithms, cellular automata, chaos theory, neural networks, and game theory.

The purpose of this special issue is to provide readers with original research articles as well as review articles that present the state-of-the-art research results and technologies allowing for the optimization of behavior in complex self-interested networks.

Potential topics include but are not limited to the following:

- ▶ Genetic algorithms in complex self-interested networks
- ▶ Models of selfish behavior dynamics
- ▶ Cellular automata in complex self-interested networks
- ▶ Complex networks and graphical games
- ▶ Chaos theory in complex self-interested networks
- ▶ Network-based automated negotiation
- ▶ Emergent behaviors in complex self-interested networks
- ▶ Distributed neural networks for complex system optimization
- ▶ Application domains of complex self-interested networks (e.g., IoT, transportation, smart grids, and citizens participation)

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/complexity/boisin/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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Submission Deadline

Friday, 5 July 2019

Publication Date

November 2019