

Social Systems: Dynamics, Games and Control on Networks

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Abstract. The last decade has seen our community becoming more and more interested in social dynamics. This interest has led to various streams of research, among which we distinguish three main ones. Firstly, techniques and ideas from systems theory have been applied to models of social dynamics that originated from outside the community. This effort has allowed to deliver convergence and stability results for several nonlinear models, such as those that postulate bounded confidence in opinion dynamics. Secondly, control theorists have proposed their own models, either out of mathematical interest or with the purpose of including some relevant social effects. The latter activity has in some cases seen fruitful collaborations with social scientists. At the same time, similar research lines have been developed in contiguous fields, such as computer science and economics, often by using game theory tools. Thirdly, some researchers have attempted to apply control methods to the relevant dynamics, at least at an academic level.

Our community has cumulated a significant experience in the field during this last decade. During the same period, the explosion of Internet-based social networking services has enhanced both the opportunity and the need for a rigorous analysis of social dynamics, which can now be supported by large data streams. Therefore, we believe that it is time for our community to make a thorough reflection about the tools that we can provide for the management of social networks, including tools for identification, estimation, and control. The urgency of effective tools has now been recognised also by the general public and the policymakers, as shown by the raging debates on fake news and online manipulation that we have witnessed since the 2016 US elections.

The purpose of this Open Invited Track will be threefold: (i) collecting contributions in this thematic area to ensure that its audience reaches the necessary critical mass; (ii) stimulate contributions that tackle the main challenges that we have briefly highlighted, and (iii) provide a forum to reflect about directions for this research.

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