POLITECNICO DI TORINO

DISMA Dipartimento di Scienze Matematiche G. L. Lagrange

ECCELLENZA 2018 • 2022

Tuesday October 29, 2019 at 15:30
Politecnico di Torino, DISMA, Aula Buzano (third floor)

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Convergence Properties of Social Hegselmann-Krause Dynamics

Prof. Giacomo Como introduces the seminar.

Abstract

We study the convergence properties of Social Hegselmann-Krause dynamics, a variant of the Hegselmann-Krause (HK) model of opinion dynamics where a physical connectivity graph that accounts for the extrinsic factors that could prevent interaction between certain pairs of agents is incorporated. As opposed to the original HK dynamics (which terminate in finite time), we show that for any underlying connected and incomplete graph, under a certain mild assumption, the expected termination time of social HK dynamics is infinity. We then investigate the rate of convergence to the steady state, and provide bounds on the maximum ε-convergence time in terms of the properties of the physical connectivity graph.

We extend this discussion and observe that for almost all n, there exists an n-vertex physical connectivity graph on which social HK dynamics may not even ε-converge to the steady state within a bounded time frame. We then provide nearly tight necessary and sufficient conditions for arbitrarily slow merging (a phenomenon that is essential for arbitrarily slow ε-convergence to the steady state). Using the necessary conditions, we show that complete r-partite graphs have bounded ε-convergence times.

Biography

Rohit Parasnis received the B.Tech. and the M.Tech.degrees in Electrical Engineering and Applied Mechanics, respectively, from IIT Madras in 2016. He is currently a Ph.D. student in the Department of Electrical and Computer Engineering at the University of California San Diego. His current research interests include social dynamical systems, network systems and control theory with a special focus on the study of opinion dynamics on social networks. He was awarded the Charles Lee Powell Foundation fellowship in 2016.

Save the date for the next event: November 13, 2019
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