Opinion dynamics on random graphs

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STELLINGEN

behorende bij het proefschrift

Opinion Dynamics on Random Graphs

1. It is possible to compute explicitly the asymptotics of the expected consensus time for the voter model on any sparse random directed graph with a known rooted Galton-Watson tree as local weak limit.
2. The fraction of discordant edges for the voter model on locally-tree-like random graphs exhibits quasi-stationary behavior.
3. In random graphs with infinite-mean degree distributions, a starlike core of highly connected nodes emerges with high probability. This core is the primary reason why mean-field conditions, i.e., sufficient conditions that make random walk behavior comparable to that on a complete graph, fail in this regime.
4. With high probability, the expected consensus time for the voter model on the directed configuration model is shorter than the corresponding quantity on the undirected configuration model.
5. Inhomogeneity of the degree sequence of a graph increases the speed of information diffusion.
6. Paradoxically, computing meeting time distributions for random walks on undirected Galton-Watson trees requires more advanced combinatorial techniques than on directed Galton-Watson trees.
7. General opinion dynamic models evolving on non-regular random graphs are not mathematically tractable due to the absence of an explicit stochastic dual.
8. Analyzing random processes on inhomogeneous random graph structures has become mathematically tractable mainly because of the recent development of local exploration processes that exploit the double source of randomness.
9. The use of expressions such as “It is obvious that”, “It trivially follows that”, “The proof is left to the reader”, should not be encouraged in academic writing.
10. Academic research is the pursuit of rare eureka moments in a sea of frustration.
11. It is unrealistic to expect academic scientists to excel at research, teaching and management simultaneously.

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