

Stochastic Opinion Formation in Scale-Free Networks

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The dynamics of opinion formation in large groups of people is a complex non-linear phenomenon whose investigation is just at the beginning. Both collective behaviour and personal view play an important role in this mechanism. In the present work we mimic the dynamics of opinion formation of a group of agents, represented by two state ± 1 , as a stochastic response of each of them to the opinion of his/her neighbours in the social network and to feedback from the average opinion of the whole. In the light of recent studies, a scale-free Barabasi-Albert network has been selected to simulate the topology of the interactions. A turbulent-like dynamics, characterized by an intermittent behaviour, is observed for a certain range of the model parameters. The problem of uncertainty in decision taking is also addressed both from a topological point of view, using random and targeted removal of agents from the network, and by implementing a three state model, where the third state, zero, is related to the information available to each agent. Finally, the results of the model are tested against the best known network of social interactions: the stock market. A time series of daily closures of the Dow Jones index has been used as an indicator of the possible applicability of our model in the financial context. Good qualitative agreement is found.

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