

Diffusion Processes on Complex Networks - Lab

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1 Assignment 6

1. Read the description of the q-voter model with independence in Mapping the q-voter model: From a single chain to complex networks by Jedrzejewski et al (<https://arxiv.org/abs/1501.05091>):
 - Implement the model with NN influence group.
 - Simulate the model with $N = 100$ agents, $q = 3$ and 4 , and the independence factor p ranging from 0.0 to 0.5 with step 0.02 . Use the following networks as the underlying topology of social interactions: complete graph, $BA(100, 4)$, $WS(100, 4, 0.01)$, $WS(100, 4, 0.2)$. Finish the simulations after 1000 Monte Carlo steps.
 - For each parameter set calculate the magnetization in the system as a function of time, averaged over 100 independent runs.
 - Plot the time evolution of the magnetization for the $WS(100,4,0.01)$ network (both averaged and from single run).
 - Plot the average final magnetization as a function of independence factor p for
 - $q = 3$ and different network topologies (one plot),
 - $q = 4$ and different network topologies (one plot),
 - $WS(100, 4, 0.01)$ network and different values of q (one plot).