Diffusion Processes on Complex Networks - Lab

Assignment 6

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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 Jędrzejewski 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).