Authors’ abstract: Given a graph $G = (V, E)$, consider Poisson ($|V|$) walkers performing independent lazy simple random walks on $G$ simultaneously, where the initial position of each walker is chosen independently with probability proportional to the degrees. When two walkers visit the same vertex at the same time, they are declared to be acquainted. The social connectivity time $SC(G)$ is defined as the first time in which there is a path of acquaintances between every pair of walkers. It is shown that, when the average degree of $G$ is $d$, with high probability

$$c \log |V| \leq SC(G) \leq Cd^{1+5/16 + \text{if not regular}} \log^3 |V|.$$ 

When $G$ is regular, the lower bound is improved to $SC(G) \geq \log |V| - 6 \log \log |V|$, with high probability. We determine $SC(G)$ up to a constant factor in the cases that $G$ is an expander and when it is the $n$-cycle.

Reviewer: E. Ahmed (Mansoura)

MSC:

- 82C41 Dynamics of random walks, random surfaces, lattice animals, etc. in time-dependent statistical mechanics
- 60K35 Interacting random processes; statistical mechanics type models; percolation theory
- 82B43 Percolation
- 60J10 Markov chains (discrete-time Markov processes on discrete state spaces)
- 05C81 Random walks on graphs
- 91D30 Social networks; opinion dynamics

Keywords:

- social network
- random walks
- giant component
- coalescence process

Full Text: DOI arXiv Euclid

References:


This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.