Grindrod, Peter; Higham, Desmond J.  
A matrix iteration for dynamic network summaries. (English) Zbl 1262.91121  

The authors extend usual centrality measures to the case of temporal networks by proposing a new algorithm for dynamic network summaries. The approach of downweighting for age is involved in the algorithm. Specifically, the iteration for the running dynamic communicability matrix $S^{[k]}$ is given by

$$S^{[k]} = (I + e^{-b\Delta t_k}S^{[k-1]})(I - aA^{[k]})^{-1} - I,$$

where $k = 0, 1, 2, \ldots$, $A^{[k]}$ is the adjacency matrix for the network at time $t_k$, $0 < a < 1$, and $b > 0$ is used to downweight by the age-dependent factor $e^{-bt}$.

Reviewer: Yilun Shang (Shanghai)

MSC:
91D30 Social networks; opinion dynamics
65F60 Numerical computation of matrix exponential and similar matrix functions
05C82 Small world graphs, complex networks (graph-theoretic aspects)

Software:
GenLouvain

Full Text: DOI Link