

BiMo—Online Appendix C

Illustration of the layered structure of a network obtained using the generalized k-core decomposition method

Figure 1 gives a simple example to illustrate the process to divide a network into a generalized k -core structure. As can be seen from the left most part of Figure 1, the example network has only four nodes and four links. The weights on the links equal 1, except for that of link $C \rightarrow B$, which equals 9. First, we compute the generalized degree for all the nodes and remove from the network all nodes with generalized degree less than 1 to obtain the generalized 1-core. In the example, because all nodes have a generalized degree no less than 1, there is no need to remove any nodes to obtain the generalized 1-core. Subsequently, we remove from generalized 1-core all nodes with generalized degree less than 2 to obtain generalized 2-core. Specifically, node D is removed from generalized 1-core.

Again, this procedure is repeated iteratively until there are only nodes with generalized degree no less than 3 left on the network, and we obtain generalized 3-core. This routine is applied until there are no nodes left in the network.

Based on the generalized k -core structure of the example network, we can obtain the generalized coreness of each node. The generalized coreness of A is 2, because it belongs to the generalized 2-core but not to the generalized 3-core. Similarly, the generalized coreness of B is 3, the generalized coreness of C is 3, and the generalized coreness of D is 1. We can further obtain that GS_1 contains D, GS_2 contains A, and GS_3 contains B and C.

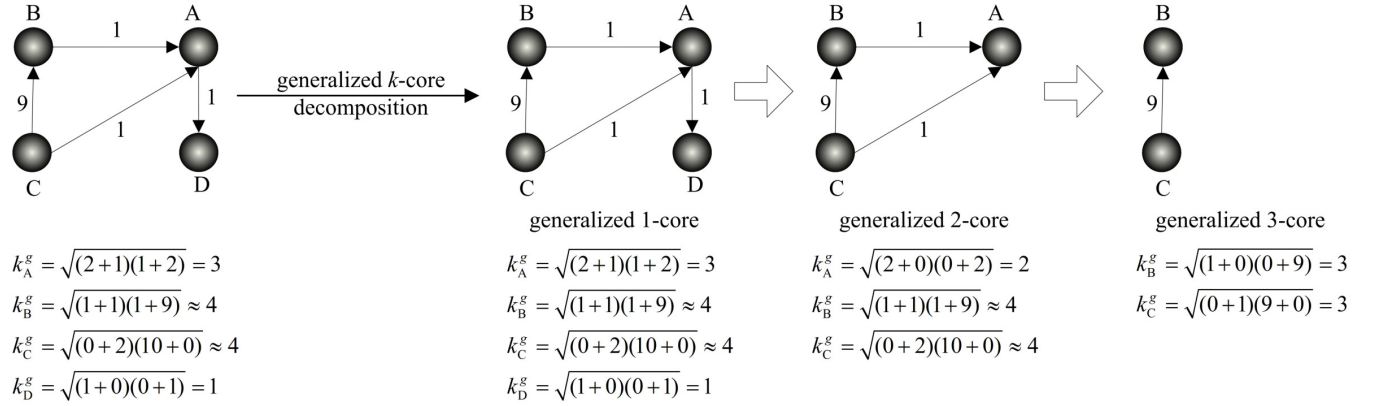


Figure 1: Illustration of the layered structure of a network obtained using the generalized k -core decomposition method. The notes on the bottom of the figure denote the generalized degree of the nodes in the corresponding networks.