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Social network analysis based on WWW search engine SANG HOON LEE, PAN-JUN KIM, YONG-YEOL AHN, HAWOONG JEONG, KAIST, Daejeon 305-701, Korea — Recently, massive digital records have made it possible to analyze a huge amount of data in social sciences, one of which is social network theory. We investigate social networks between people by extracting information on the World Wide Web. Using famous search engines such as Google, we construct weighted social networks where the nodes are the names of people and the weight of each link is assigned as the number of web pages including both of the names attached to the link. The weight distribution is found to be quite broad with the heavy-tail. The strength of a node, defined as the sum of weights over the node, is strongly correlated with the number of web pages including the single node. We compare networks constructed by this method with real networks to test the reliability of the method. Furthermore, we suggest the quantity, called the effective degree, characterizing the homogeneity (or heterogeneity) of weight distribution for each node in the weighted network. Another way to quantify the importance of each node, based on the effective degree, is also introduced.

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