Co-authorship Networks in Industrial Ecology Domains: the Growth and Change of Networks

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Network theory and studies have developed considerably since beginning in the 1950’s. It has been used widely in electrical engineering, computer science, engineering economics, social science, business applications (for example, modeling increasingly complex inventory and logistics systems) and biology, where it has increasingly proven to be a powerful tool in systems ecology and in enabling understanding of complex metabolic pathways and processes. Also this network approach was applied for measuring the link strength between nodes (authors) and analyzed actual co-authorship networks. Paper co-authorship is one of the most tangible and well documented forms of scientific collaboration. Many co-authorship networks have been studied extensively from various angles such as degree distribution analysis, social community extraction and social link prediction and so on. However, up to date, there is no any co-authorship network study in industrial ecology research community. In this study, we collected the co-authorship data and keywords from the Journal of Industrial Ecology (from volume 1, issue 1 in 1997 to volume 16, issue 5 in 2012) and International Journal of Life Cycle Assessment (from volume 1, issue 1 in 1996 to volume 17, issue 9 in 2012). Based on the collected data, we evaluated co-authorship network characteristics, such as, sets of key players, closeness degree centrality, closeness centrality, betweenness centrality, eigenvector centrality, and clustering coefficient.