On Understanding Centrality in Directed Citation Graph

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Abstract: Modeling complex networks as directed/undirected graphs is considered one of the most common methods in network science. Citation graph is a directed graph of scientific published papers. This graph has been studied massively in the past decade. Citation graph can be utilized to study relationships between authors and papers. It can be used to study the characteristics of citation network to demonstrate the growth model, graph type and to predicted hot new topics. In this paper, we attempt to study the relationship between popularity of a paper and the publication date. The purpose of this study is to demonstrate the relation between paper quality and hot topics. Betweenness metric has been used to measure the popularity of a published paper. Moreover, a comparison between betweenness and citation count (node degree) has been conducted to show that papers may have a small citation count; however, they may have a great impact in research field. We have generated a directed citation graph by crawling paper information from CiteSeerx. Our study shows that date of publication is important to write a popular paper. However, high quality papers get opportunity to be popular regardless the date of publication.