

A Leading Author Model for the Popularity Effect on Scientific Collaboration

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Abstract

In this talk, we focus on the popularity effect of the scientific collaboration process that popular authors have an advantage in making more publications. Standard network analysis has been used to analyze the scientific collaboration network. However, the standard network has limitations in explaining the scientific output by binary coauthorship relationships since papers have various numbers of authors. We propose a leading author model to understand the popularity effects mechanism while avoiding the use of the standard network structure. The estimation algorithm is presented to analyze the size of the popularity effect. Moreover, we can find influential authors through the estimated genius levels of authors by considering the popularity effect. We apply the proposed model to the real scientific collaboration data from the Web of Science. For each subject, we build a model and estimate four major parameters in the model. Statistical tests are conducted to determine how differ the model parameters among subjects. We introduce a spiral plot to illustrate the similarity of the parameters of the leading author model of a target subject towards all others. This is a joint work with Dr. Hohyun Jung (Sungshin Women's University, South Korea) and Mr. Tony Ming Yen Lai (DSDP, National Taiwan University, Taiwan).