

PROCEEDINGS OF  
THE FIFTH BIENNIAL  
CONFERENCE OF  
THE INTERNATIONAL  
SOCIETY FOR  
SCIENTOMETRICS  
AND INFORMETRICS



ROSARY COLLEGE  
RIVER FOREST, IL, USA  
JUNE 7-10, 1995

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GRADUATE SCHOOL OF LIBRARY AND INFORMATION SCIENCE

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# A NEW APPROACH TO DISPLAY REAL CO-AUTHORSHIP AND CO-TOPICSHIP THROUGH NETWORK MAPPING

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Technology watch consists of collecting and analyzing two kinds of information: formal and informal information. One of the most interesting point concerning the management of formal information is the choice of the appropriate bibliometric tool. One of the main points concerning the management of informal information is the identification of staff members of the company which are the most involved in the informal collecting process [ALL]

The subject of this paper is to present an algorithm which allows automatic drawing of network. It can be used efficiently in both cases, that is as a bibliometric tool or as a way to identify the « gatekeepers » through the analysis of the inter-member relationship map. If we focus on the network as a bibliometric tool, we can find many uses of this technics. It can be used so much to show the map of collaboration between authors if we consider the field « author » of bibliographic references as a concept network if we consider the field « keyword » of bibliographic references.

This approach is original for two reasons a) the mesure used to evaluate item association and b) the definition of groups [PET]. For a), most other methods use distances between members as an agregation criteria. In that case, a link between two members does not even signify that there exists a relationship between these two members. Therefore the map as a final result does not represent the real relationships between members but a degree of similarity. The starting point of our algorithm is symmetrically square matrix representing co-publishing of authors, co-occurrence of keywords or information flow between actors. The technique does not use metrics and saves the integrity of the information contained in the initial relation matrix between groups members.

For b) most methods make the agregation in groups by studying inter-groups relationships. Those members who are grouped together in the same cluster are not necessarily in relation, but they have a similarity in their relationship with other groups. We consider intra-group relationship as an agregation criteria. This mean that we are grouping together members with good relationship. The technique used leaps up two successive manipulations. The first one divides up the whole actors into several groups e.g. looking for the strongly connected components of the graph. The second one consists in identifying subgroups, within each strongly connected component, by finding isthmuses [AHO]: These so-called point isthmuses are those points that, if removed, increase the number of the strongly connected components of the graph.

The automatic drawing of network is relevant for many reasons. The visual and synthesis character of the network approach make the information more comprehensive and easier to memorize for the user. Network can make emergent subjects clearer.

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