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

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

SPONSORED BY THE ROSARY COLLEGE
GRADUATE SCHOOL OF LIBRARY AND INFORMATION SCIENCE
FIFTH INTERNATIONAL CONFERENCE
OF THE
INTERNATIONAL SOCIETY FOR
SCIENTOMETRICS AND INFORMETRICS
PROCEEDINGS—1995

June 7-10, 1995

Sponsored by
ROSARY COLLEGE
GRADUATE SCHOOL OF LIBRARY & INFORMATION SCIENCE
RIVER FOREST, ILLINOIS
USA

Edited by
Michael E.D. Koenig
Rosary College
&
Abraham Bookstein
University of Chicago

Learned Information, Inc.
Medford, NJ
MEETING ORGANIZER
Michael E.D. Koenig
Rosary College

PROGRAM CHAIR
Abraham Bookstein
University of Chicago

REGIONAL PROGRAM CHAIRS

Asia
Ravichandra Rao
Indian Statistical Institute
Bangalore, India

Europe
Leo Egghe
Limburgs Universitair Centrum
Belgium

North America
Abraham Bookstein
University of Chicago
USA
PROGRAM COMMITTEE

Asia
Ravichandra Rao, Indian Statistical Institute, Chairman
Aparnu Basu, National Institute of Science, Technology, and Development Studies
Mari Davis, University of Melbourne
Hajime Eto, University of Tsukuba
B.K. Sen, Indian National Scientific Documentation Centre
Yishan Wu, Information Analysis and Research Center

Europe
Leo Egghe, Limburgs Universitair Centrum, Chairman
Manfred Bonitz, M.B.I.
Tibor Braun, Eötvös Lorand University
Q.L. Burrell, University of Manchester
Wolfgang Glänzel, Library of the Hungarian Academy of Sciences
Peter Ingwersen, The Royal School of Librarianship
Sylvan Katz, University of Sussex-Brighton
Alexev Korennoy, Ukrainian Academy of Sciences
Jan Kozlowski, KBN State Committee for Scientific Research
Hildrun Kretschmer, Association for Science Studies, e.V.
Thierry Lafouge, Ecole nationale superieure des l'information et des bibliotheques (ENSIB)

Ceex le Pair, Stichting voor de Technische Wetenschappen
Technology Foundation
Valentina Markusova, VINITI
Emilio Matricciani, Politenica di Milano
Aida Mendez, Institut d'Estudies Avancats de le Illes
H. Moed, University of Leiden, CWTS
Karl Muller, Institute for Advanced Studies
Bluma Peritz, The Hebrew University of Jerusalem
L. Quonian, Centre de Recherche Retrospective de Marseille
A.F.J. Van Raan, University of Leiden, CWTS
Ronald Rousseau, Katholiekke Industriele Hogeschool
William Turner, CERESI/CNRS
Peter Vinkler, Hungarian Academy of Sciences
PROGRAM COMMITTEE

North America

Abraham Bookstein, University of Chicago, Chairman USA
Terrence Brooks, University of Washington USA
Susan Cozzens, Rensselaer Polytechnic Institute USA
Blaise Cronin, Indiana University USA
Belver Griffith, Drexel University USA
Kate McCain, Drexel University USA
Bill McGrath, SUNY - Buffalo USA
Francis Narin, CHI Research, Inc. USA
Mike Nelson, University of Western Ontario CANADA
Miranda Pao, University of Michigan USA
Jane Russell, Universidad Nacional Autónoma de México MEXICO
Henry Small, Institute for Scientific Information USA
Jean Tague, University of Western Ontario CANADA
Radosvet Todorov, University of Maryland (Visiting) USA
Howard White, Drexel University USA
A NEW APPROACH TO DISPLAY REAL CO-AUTHORSHIP AND CO-TOPICSHIP THROUGH NETWORK MAPPING

E. Boutin
IUT de Toulon, La Garde, France

L. Quoniam, H. Rostaing and H. Dou
CRRM, Université Aix Marseille III, Marseille, France

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.

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 technique. 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 measure used to evaluate item association and b) the definition of groups (PET). For a), most other methods use distances between members as an aggregation criteria. In that case, a link between two members does not even signify that there exists a relationship between those 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 aggregation 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 aggregation criteria. This mean that we group 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 subgraphs, 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.


[ALL] ALLEN I. Managing the flow of technology, the MIT Press, Cambridge, Massachusetts, United States, 1977