

Research Activities and Networks in CAIS Conferences for the Period of 1993-2015: Social Network Analysis

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Abstract:

This study analyzes authorship & co-authorship of the research papers published in the CAIS conferences from 1993 to 2015. It discovers characteristics of research activities, including key authors and a collaboration network. It contributes to an understanding of research activities from the CAIS professional community over the years.

Introduction

Academic conferences can be conceptualized as communities of practice, wherein knowledge sharing and building, scientific collaboration and learning activities take place constantly. The Canadian Association for Information Science / Association canadienne des science de L'information (CAIS/ACSI) has consecutively held 43 annual conferences since its inception in 1973. The conference has become a primary research community in the field of library and information science (LIS) in Canada. While people take advantage of this community, however, little attention has been given to how the community grows and shapes over the years. We have rather limited knowledge about the community structure and how researchers in the community interact and collaborate. Lack of such knowledge presents considerable challenges to understanding the formation and development of the community. Furthermore, it may prevent people from well maintaining, nurturing, and further expanding the community.

In this study we regard annual CAIS/ACSI conferences as an independent, evolving, and integrated professional research community. The purpose of this study is to better understand the research activities and social structure of the community focusing on scientific collaboration therein. To attain the research goal, two research questions are formulated to guide through the study:

1. What are the characteristics of research activities of this community, such as key authors?
2. How are actors connected with one another in research collaboration?

The first research question aims to identify key nodes and main clusters that backbone the community. The second research question focuses on exploring relationships among the actors and clusters, mapping the connections, and revealing any discernable patterns of scientific collaboration activities carried out in the community.

Methodology

Scientific communities can be complex as they often overlap and have fuzzy boundaries. To address the research questions, we employ a co-authorship analytic approach, which is a type of social network analysis (SNA) and has repeatedly been used to analyze community structure and scientific collaboration.

As a trade organization, the CAIS/ACSI has established a web-based digital archive for its annual conference proceedings. The archive serves as a central and authoritative repository of all full papers published in the conference proceedings between 1993 and 2015. From the archive website (<http://www.cais-acsi.ca/ojs/index.php/cais/issue/archive>), we collect bibliographic data (i.e., author names, publication year, author's affiliation) of all full papers. Because we are only interested in fully-developed research papers, so the bibliographic information about those keynote, panel, and poster presentations are not gathered. In addition, the data of full papers published in those proceedings between 1973 and 1992 are not considered in this study because they are not available at the archive website.

In fact, the data provided on the archive website are incomplete and imperfect, especially in author names and hyperlinks to papers. Thus, various additional sources (both electronic and print), such as CAIS conference programs, authors' resumes, and Google Scholar, are consulted to create a correct and complete author bibliographic dataset. Furthermore, we have to deal with the inconsistency issue. For example, various forms of an author's or an organization's name appear across different years, and they have to be normalized into a consistent form.

The collected data are processed and converted to an author-to-author matrix (called co-authorship matrix), where a cell value indicates the number of papers co-authored by the two authors corresponding to the row and column of the cell. The co-authorship matrix can be interpreted as a collaboration research network that demonstrates how often who produce papers with whom. To further analyze the data, we use two SNA software packages, UCINET and Netdraw – UCINET to calculate the various types of network centrality and Netdraw to visualize the co-authorship network.

Results

Between 1993 and 2015, CAIS/ACSI has held 23 annual conferences, where a total of 827 full papers are published, and 777 authors, who represent 25 countries and 208 organizations, are identified.

From 1993 to 2004, both the numbers of published research papers and contributed authors remain at a steady level—less than 40 and 70 each year, respectively. From 2005 to 2012, far more research papers are published per year, and more authors get involved in, too. After 2012, the two numbers fall back a little bit.

Regarding the number of co-authors per author, the results indicate that the average number of collaborators per author is 2.26. Almost half of the total authors (372 out of 777) have never collaborated with anybody or have collaborated with only one other person. Over the years more than 90% of the authors (716 out of 777) have collaborated with 5 or fewer than 5 others; and less than 3% (17 out of 777) of the authors have collaborated with either 10 or more than 10 others.

Regarding the number of co-authors per paper, the results show that the average number of co-authors per paper is 1.8. Single-author papers are dominant (50.2%, 415/827) followed by two-author papers (31.4%, 260/827).

Regarding key authors, top 10-ranked authors are identified based on seven different criteria: three non-SNA criteria (number of participating years, total number of papers, and total number of co-authors) and four centrality-based SNA criteria (degree centrality, closeness centrality, betweenness centrality, and weighted degree centrality).

The result lists using non-SNA criteria show that a majority of authors on any list are cross-listed to a considerable extent. More specifically, the top 5-ranked authors listed under each of the three non-SNA criteria are cross-listed within top 10-ranked in other two lists, except only one case. To check how each list is related to each other more closely, the Pearson correlation test is applied to the three full-ranking lists. The result shows that all the pairs of the lists are significantly correlated to each other.

The result lists using SNA criteria show that the rankings of same authors are quite different from each other across the four criteria. For example, 'Jamshid Beheshti' is ranked as the 1st in Weighted Degree Centrality, the 3rd in Degree Centrality, but out of top 10 ranked in the other two criteria. A more extreme case can be found at 'Rebekah Willson' who is ranked as 2nd in Closeness Centrality but out of top 10 in the other three criteria. The Pearson correlation test is also applied to the four full-ranking lists. The result pair lists show a series of relationships from weak to very strong, and a very strong relationship is found in the result between Degree Centrality and Weighted Degree Centrality.

Regarding collaboration network, its visualization illustrates that the co-authorship network consists of a number of disconnected components whose sizes vary from 1 to 214 nodes (authors).

Conclusion

The CAIS/ACSI annual conference is an active professional research community, which has played a leading role in LIS research in Canada. This paper provides an in-depth co-authorship analysis on all the research papers published in the conference proceedings since 1993, identifying out basic research activities, key authors and research clusters, as well as an overall collaboration structure of the community. The overall outcome of this study presents a snapshot of the research landscape over the past two decades, indicating that seven Canadian LIS schools are the backbone of the LIS field in this country, and the research collaboration tends to occur much more within the schools than across the schools.