

# Chapter 10

## Scientograph–Based Visualization of Computer Forensics Research Literature

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### ABSTRACT

*Studying the communication pattern of scientific information produced as a result of academic and industrial research using mapping techniques is part of scientometric studies. In this chapter, the bibliographic data related to computer forensics retrieved from SCOPUS is subjected to mapping and visualizing. The results showed that the computer forensics literature grows exponentially. USA ranks first among the countries contributing to the literature growth. The University of South Australia is top ranking institution and K.K.R. Choo is the top-ranking author. Conference proceedings are the dominant form of communication flow. The scientograph of keywords reveals six clusters and the keywords with high frequency of occurrences are computer crime, security of data, network security, electronic crime countermeasures, digital forensic, internet, cryptography, cloud computing, cyber security, malware, and intrusion detection.*

### INTRODUCTION

Scientometrics is the quantitative study of scientific communication (Leydesdorff, 2001). It requires the use of a multitude of sophisticated techniques including citation analysis, social network analysis and other quantitative techniques for mapping and measurement of relationships and flows between people, groups, organizations, research papers, computers and other knowledge entities (Niazi & Hussain, 2011). Domain visualization is a relatively newer research front. The idea is to use information visualization to represent large amount of data in research fronts (Chen, Paul & O'Keefe, 2001). This allows the viewer to look at large corpus and deeper insights based on high level view of the map (Card, Mackinlay & Shneiderman, 1999). Garfield (1994) used bibliographic data to create longitudinal maps which are called scientographs, though not widely used.

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Information and Communication Technologies (ICT) are among the fastest growing technologies around the globe. Information Technology (IT) and Information Technology Enabled Services (ITES) industry has grown out of proportion throughout the world. It has influenced every sphere of life and hence we come across a bunch of knowledge domains attached with the letter ‘e’, which means electronic. Thus, we have e-banking, e-commerce, e-payment, e-libraries, etc. This in turn has led to e-crimes happening everywhere and a new field of computer forensics came into existence.

Though there are many areas such as, network forensics, data forensics, information forensics, cyber forensics, digital forensics each a specific field in its own right the term computer forensics is being used as a synonymous term for all these. All these fields are closely associated with each other as the keyword analysis in this reveals.

## **REVIEW OF LITERATURE**

Numerous scientometric and bibliometric studies have been conducted various domains of knowledge by various professionals of field as well as knowledge managers. A comparative scientometric study on Indian and Chinese computer science research has been done by Suresh Kumar and Garg (2005). Heilig and VoB (2014) conducted a scientometric study of cloud computing literature. However, no scientometric study has been done on computer forensics except a single journal study on “Digital Investigation” by Jeysekar and Saravanan (2014). Hence this study was conducted by the authors to fill the felt need.

## **MATERIALS AND METHOD**

The data for the study is downloaded from the bibliographic database SCOPUS. SCOPUS is an international multidisciplinary indexing and abstracting database. It covers more than 15,000 international peer reviewed journals in Science and Technology and more than 500 international conference and seminar proceedings. It is a product of *Elsevier* and is subscription based. The data retrieved is further cleaned for analysis and then analyzed using *Microsoft-Excel*. The computer algorithm *VOSviewer* and *Microsoft-Word* picture tools are used for visualization.

## **RESULTS AND DISCUSSION**

The results obtained from the study are offered under the sub-heading (1) Year-wise contribution; (2) Country-wise contribution; (3) Top contributing institutions; (4) Author-wise contributions; (5) Journal-wise contributions; (6) Document type; (7) Subject-wise contributions; and (8) Scientographs of keywords.

### **1. Year-Wise Contribution**

The year-wise contribution of bibliography is tabulated and presented in Table 1. A total of 4978 bibliographic records on computer forensics are indexed in SCOPUS.

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