Methodologies for Visualizing Publication Impacts and Collaborations at a Research Institute

Stacy Bruss

stacy.bruss@nist.gov

Susan Makar

susan.makar@nist.gov

Amanda Malanowski

amanda.malanowski@nist.gov

Katie Rapp

katie.rapp@nist.gov

Introduction

The Information Services Office (ISO) at the National Institute of Standards and Technology (NIST) analyzed the impact of NIST’s peer-reviewed forensic journal literature through citation analysis and network visualizations. This initial study identified collaborations and areas of greatest impact for forensic research at NIST. ISO shared its study results in a poster session at a conference for forensic researchers.

The methodology and skills ISO developed for this project have wide applications beyond the initial study. The methodology can be used for similar studies in other disciplines. In addition, as a result of this study, ISO has developed broader applications for data visualizations and markets these to researchers at NIST, increasing our visibility and ability to support NIST research. By participating in a customer poster session, ISO gained experience and insight into its customers’ research and publication processes. Other libraries can apply these types of analyses and visualizations to serve customers in a variety of fields.

Methodology

A Web of Science (WoS) database search identified NIST forensic publications. ISO’s iterative WoS search strategy used a variety of forensic-related keywords and included knowledge of forensic publishing at NIST.

A network structure was created using Sci2 to extract a co-author network from the WoS search results, which was then visualized using Gephi. Authors (represented by circles in the visualization) were connected to collaborators (via lines) and arranged using Gephi algorithms. Gephi functions allowed resizing the nodes and lines based on the number of citations and collaborations, respectively. Subdisciplines for the network were assigned manually by studying the underlying papers for each author and identifying their predominant research field.

Interpreting the Visualization

This co-author network shows the collaboration between authors who have published two or more papers together. Each node represents an author, NIST or non-NIST, who has co-authored with a NIST scientist, and is sized to represent the number of citations the author has received. The largest node in the center of the network represents the primary forensic author at NIST.

For More Information

To download a copy of this poster and others from ISO staff, use this QR code or visit nist.gov/forensics.

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