

Thesis Defense

Institute for Software Research

Computation, Organizations and Society

Medical Academic Genealogy and Information Diffusion:

A Case Study in Neurosurgery



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The scientific and medical communities have long recognized human factors influence research results. Indeed, a growing body of literature suggests that even the best-designed medical studies are affected by sources of bias. As medicine embraces an “evidence-based” paradigm in which data drives decisions, it is important to recognize that all evidence comes from human sources. Understanding the researchers behind a paper, and the social and/or meta-networks behind those researchers, is crucial to understand and evaluate research results. To evaluate this properly, it is necessary to employ a set of computational techniques grounded in social network analysis.

In this thesis, I develop and employ the idea of a “medical academic genealogy”, a network of authors linked to a founding department chairman. I demonstrate that identified medical academic genealogies can be correlated with research results, meaning that individuals who train in key genealogies are likely to publish similar results. Additionally, I show that researchers within an academic genealogy are likely to publish in specific journals. As a case study in this phenomena, I examine a controversial neurosurgical issue: the question of extent of surgery for high grade glioma (a type of brain cancer).

To do this, I will pull from an interdisciplinary body of literature, including dynamic network analysis, computer science, information diffusion, neurosurgery, and genealogy studies. The quantitative tools I develop will be important for understanding how individual research papers are interrelated, and can indicate ways in which literature reviews may be unwittingly affected by medical academic genealogy.

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