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Citation Networks in Law: Detection of Hierarchy and Identification of Key Events

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Citation networks can be used to make powerful analyses about human intellectual activity in diverse fields. However, universal rules governing their structure and dynamics have not yet been discovered. To address this, my research probes the influence of social and institutional hierarchy on the structure and dynamics of citation networks. Hierarchy is a fundamental feature of all human social organizations; therefore, any citation network is necessarily embedded in an “underlying” hierarchy that in turn determines properties of the network. Through this new way of analyzing citation networks, my research seeks to advance the understanding of phenomena central to societal progress, such as: the emergence of research fronts and seminal publications; how paradigms form, take hold, become unstable, and collapse; innovation and the emergence of new technologies; and the emergence of new legal doctrine and the evolution of the law.

I will present an analysis of a novel data set (that I have created) that covers all hierarchical levels of the Canadian legal system for a specific area of law (defamation law). My presentation will show: 1) an evaluation of a recently published method for inferring hierarchies among scientific journals based on scientific citation networks by applying that method to my novel data set, in order to determine if the method is capable of detecting the known underlying court hierarchy; and 2) ways in which network analysis methods (node-ranking via authority scores and node-grouping via community detection/clustering) can identify important periods in the evolution of the law (e.g. turning-points in legal “eras”, in which the law is applied in a new way). Points 1 and 2 will be discussed in relation to the overarching goal of understanding the influence of underlying hierarchy on the structure and evolution of citation networks in law and other fields.

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