

**NETWORK SCIENCE AND LAW:  
A SALES PITCH AND AN APPLICATION TO THE “PATENT EXPLOSION”**

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**Abstract:** The network may be the technological metaphor of the present era. A network, consisting of “nodes” and “links,” may be a group of individuals linked by friendship; a group of computers linked by network cables; a system of roads or airline flights -- or another of a virtually limitless variety of systems of connected “things.” The past few years have seen an explosion of interest in “network science” in fields from physics to sociology. Network science highlights the role of relationship patterns in determining collective behavior. It underscores and begins to address the difficulty of predicting collective behavior from individual interactions. This Article seeks first to describe how network science can provide new conceptual and empirical approaches to legal questions because of its focus on analyzing the effects of patterns of relationship.

Second, the Article illustrates the network approach by describing a study of the network created by patents and the citations between them. Burgeoning patenting has raised concerns about patent quality, reflected in proposed legislation and in renewed Supreme Court attention to patent law. The network approach allows us to get behind the increasing numbers and investigate the relationships between patented technologies. We distinguish between faster technological progress, increasing breadth of patented technologies, and a lower patentability standard as possible explanations for increased patenting. Our analysis suggests that increasing pace and breadth of innovation alone are unlikely to explain the recent evolution of the patent citation network. Since the early 1990s the disparity in likelihood of citation between the most “citable” and least “citable” patents has grown, suggesting that patents may be being issued for increasingly trivial advances. The timing of the increasing stratification is correlated with increasing reliance by the Federal Circuit Court of Appeals on the widely criticized “motivation or suggestion to combine” test for nonobviousness, although we cannot rule out other explanations. The final part of the Article describes how network analysis may be used to address other issues in patent law.