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Drivers of the decrease of patent similarities from 1976 to 2021

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The citation network of patents citing prior art arises from the legal obligation of patent applicants to properly disclose their inventions. One way to study the relationship between current patents and their antecedents is by analyzing the similarity between the textual elements of patents. Many patent similarity indicators have shown a constant decrease since the mid-70s. Although several explanations have been proposed, more comprehensive analyses of this phenomenon are rare. In this paper, we use a computationally efficient measure of patent similarity scores that leverages state-of-the-art Natural Language Processing tools, to investigate potential drivers of this apparent similarity decrease. This is achieved by modeling patent similarity scores by means of general additive models. We found that non-linear modeling specifications are able to distinguish between distinct, temporally varying drivers of the patent similarity levels that explain more variation in the data compared to previous methods. Moreover, the model reveals an underlying trend in similarity scores that is fundamentally different from those that have been recently illustrated.

Keywords

Citation networks, patent similarity, NLP, Sentence-BERT

Topics

- Statistical methods and models for network analysis

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