Research Area

Using the internet as a case study, this study introduces a data-driven method to predict technology expansion trajectories based on the *knowledge relatedness* between patent classes calculated using patent data from the United States Patent and Trademark Office (USPTO) and the Cooperative Patent Classification (CPC) system.

Ideas

- Use of *knowledge relatedness* as a determinant for the expansion trajectories of a certain technology
- Use of the Internet as a test case for the prediction method due to high volumes of Internet patenting activity

Method

- Calculation of *knowledge relatedness* between *spheres of knowledge* for 1980 to 2018
- Retrieval of internet patents and their associated patent classes using keyword search
- Assigning predictions as *spheres of knowledge* with *knowledge relatedness* (relative to those associated to internet patents) higher than a predetermined threshold
- Testing the prediction accuracy and optimal prediction thresholds using the *ROC curve*

Findings

- There is an overall positive correlation between knowledge relatedness and the predictability of expansion trajectories
- The mean optimal prediction threshold is at a knowledge relatedness of 0.22
- The prediction method has an average accuracy of 74% between 1980 and 2004
- Accuracy drops drastically past 2005, likely as a result of a critical saturation of internet technology in the knowledge space