The complexity of new knowledge: a new measure of novelty in patents

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In the presentation, I will show a new approach to measure similarity and novelty in patents. The approach is based on the analysis of patent texts and investigates the similarities and originalities in concept recombination. The methodology detects concepts discussed in a set of patents through a state-of-the-art topic modelling technique, the Latent Dirichlet Allocation (LDA). The LDA allows representing each patent as a probability distribution over topics and defining a measure of similarity between patents based on the comparison of these probability distributions via the Hellinger distance. This approach also allows defining an indicator of novelty that assigns high novelty to patents that originally recombine existing concepts. The new indicator of novelty accounts for topic evolution (considering five-year time windows) and defines novelty as the average distance (or dissimilarity) between a patent and the closest sample of previous patents. Compared to existing measures of novelty based on patent texts, this indicator does not depend on methodology specifications (as the number of topics) and innovation success, it accounts for the presence of polysemy and synonymous, and it accurately detects the novelty of all patents, also those in small research areas. Moreover, following the evolutionary and complexity literature, it recognizes the endogenous nature of knowledge production and identifies in the recombination of existing knowledge pieces the source of new knowledge.

The presentation will take approximately 10 minutes.