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ANALYZING AND PREDICTING R&D COLLABORATION NETWORKS IN THE METAVERSE INDUSTRY

Abstract:

Innovation ecosystems have become an indispensable element in the growth strategy of firms in various industries. In the birth stage of innovation ecosystem, it is important for firms to assess technological positions of various actors in the innovation ecosystem to support decisions on external R&D collaboration. This research integrates semantic analysis and bibliometric analysis for predicting evolving collaboration patterns and predict collaboration potential. Semantic analysis applies the context-aware deep learning framework based on BERT [14] to analyze unstructured patent data and evaluate technological similarity between individual firms. In addition, biblio-metric analysis uses patent indicators related to technological capabilities and potential technology synergy of individual firms. Then, the deep neural network (DNN) approach is used to learn the relationships between descriptive features and collaboration potentials as target feature. Our findings suggest that the metaverse innovation ecosystem remains in its nascent stages, with the collaborative network still being sparse. The illustrative example reveals that recommended candidate partners often align with or resemble past partners from prior periods. This suggests that the pro-posed deep learning approach is capable of predicting collaborative relationships between various firms.

Keywords:

Innovation ecosystems, deep learning, collaboration network, natural language processing.