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基于专利引证网络的技术进化路线分析——以数据挖掘领域为例

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Technological evolutionary trajectories based on patent citation network-By data mining domain as example

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摘要 应用搜索路径连接统计法和搜索路径节点对统计法计算引证路径的连接度,提出了一种基于专利引证网络的技术进化路线提取算法。从美国专利数据库中采集了5073项1975年至1999年授权的数据挖掘领域的相关专利,分析了专利的地区分布情况和年度分布情况。从专利数据集NBER中查询得到专利引证关系,利用网络分析软件Pajek构建专利引证网络,提取了数据挖掘领域的技术进化路线。由实验结果可知,技术进化路线包含创新、扩散和突破,是一个渐进式创新和根本性突破相结合的过程。根据专利内容将主要进化轨迹分为三段,从继承性和延续性的角度分析了各阶段技术的发展情况。最后对下一步的研究工作进行了展望。

关键词: [技术进化路线](#) [专利引证网络](#) [连接度分析](#) [数据挖掘](#)

Abstract: Search path link count and search path node pair are applied to calculate the connectivity of citation path and a technological evolutionary trajectory extraction algorithm based on patent citation network is put forward. The 5,073 patents related to data mining which were granted during the period of 1975-1999 from database of United States Patent and Trademark Office are collected. The geographical distribution and annual distribution of the patents are analyzed. By querying the patent data set of NBER to get patent citation relations and the network analysis software of Pajek is used to build a patent citation network. The technological evolutionary trajectories of data mining domain are extracted. The experimental results show that the trajectories include innovation, diffusion, and breakthrough. It is a process combining incremental innovation with fundamental breakthrough. From the perspective of patent content, the top evolutionary path is divided into three sections. The technological development of each section is analyzed based on inheritance and continuity. Finally, the further research work is prospected.

Keywords: [technological evolutionary trajectory](#) [patent citation network](#) [connectivity analysis](#) [data mining](#)

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