Chapter 8
A Survey About the Application of Artificial Intelligence in Search Engines: Opportunities and Challenges of Artificial Intelligence

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ABSTRACT

Artificial intelligence (AI) mimics or stimulates human behaviors or thinking to solve specific problems. It has been applied in the analysis of huge datasets and provides reliable outputs without human supervision in various online platforms, for example, information retrieval in search engines, digital assistants, voice assistants, digital marketing, personalized learning, social media, etc. This technology has provided many opportunities and challenges in line with strengthening the authenticity of the information provided via different search engines. This chapter reviews the current pieces of literature about the different AI algorithms used in the most popular metasearch engines and the application of artificial intelligence in these search engine contexts.

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INTRODUCTION

Communication using social media and Information searching are the two most prevalent activities done on the Internet (Polak, 2017). A user may use any browser like Mozilla firefox, Google chrome, Microsoft edge, safari, or internet explorer when searching for a keyword. This process will be enhanced by a sophisticated program called a ***search engine***. This program uses specific algorithms to find related information over the internet that appears to match the keyword defined by the user in the search query (Sharma et al., 2019). Web search engines allow internet users to find all important information from extensive big data. The web search business lives to offer an excellent search service to a user's search request, therefore it is very necessary to be improved frequently so that it can respond to the user in the most precise way, quickly, and with reliable information.

However, most unauthentic information owned by different individuals and businesses is highly ranked due to commercial interest of attracting customers making relevant valued information be hidden away from the top position results returned by the search engine. There are several different search engines, for example, e-commerce search engines (Amazon and eBay), and social media search engines like (FaceBook, and YouTube), most popular search engines include, Google, Bing, Baidu, and Yandex. These most popular search engines help a user when searching for information, maps, videos, images, products, or something local. Search engines like Google use several search algorithms all working together to mine useful information. Examples of Google search algorithms (GSA) include PageRank, Pigeon, Hummingbird, Mobilegeddon, Intrusive Interstitials Update, Panda, and Penguin, among others.

The primary aim of GSAs is to rank websites with the best factors such as the backlinks, content, keywords, user experience, and several others. These classified algorithms were limited due to the dramatic growth of the **internet, Big data,** and **massive information** circulating across the globe. This slows down the effectiveness of getting reliable search results (Neogy & Paruchuri, 2014). Hence a need for complex advanced navigation algorithms. Web search engines were also considered to be exhaustive and thoughtfully considered to respond to users' ambiguity when formulating search requests to search engines and their interest to reach a wider audience (Serrano, 2016b).

The new branch of computer science called ***artificial intelligence*** (AI) helps search engines listen to the user requests, understand the language and keywords provided in the search query, perform ranking, and provide improved search results to the user. AI advancements, implementation, and combination with other technologies like machine learning (ML) in search engines, promise ease, and improved search results. These AI and ML advancements are outperforming the traditional search tools that are based on keywords relevance or statistical algorithms (Sharma et al., 2019). The traditional search tools are ignorant of the meaning of the keywords searched for in context.

Furthermore, they are challenged with getting a sense of unstructured information which includes; text files, email, social media, mobile data, business applications, and other formats. Search engines deploy several AI algorithms to provide a good user experience. They only require to be trained on huge datasets to acquire embedded knowledge to work efficiently and effectively in a long run. Strategies to overcome the challenges. Any type of Search engine is computer software that needs to understand human language as well to successfully and precisely find the information users they're looking for. This acquires them with cognitive features of understanding the meaning of keywords written in human language in search engines and also enables them to extract meaningful information from any webpage. Hence, lays the foundation for the application of Natural Language Processing (NLP), a field of AI devoted to training computers to comprehend human written language.