IR with and without GA: Study the Effectiveness of the Developed Fitness Function on the Two Suggested Approaches

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Abstract:

This paper proposes two IR approaches; the first is IR with GA, which is a GA-based IR approach. This approach introduces modified GA operators that allow IR with GA to achieve high performance. The second IR model is IR without GA, which is based on traditional IR approach. Both enhance the precision and recall of the web search by improving the document representation where an enhanced inverted index is developed for this purpose. Moreover, these two models use the same proposed evaluation function for measuring the document relativity to the user query. A number of experiments were conducted to compare the performance of the two suggested approaches with existing techniques. The two suggested approaches were then compared experimentally with another two techniques of classical IR namely Okapi-BM25 fitness function and Bayesian inference network model from documents quality of retrieval perspective. The obtained results demonstrate a good level of enhancement to the recall and precision times. In addition, the documents retrieved by IR with and without GA are more accurate and relevant to the queries than that retrieved by other techniques. Overall, the two suggested approaches provide a promising technique in web search domain delivering a high quality search results in terms of recall and precision