Image retrieval based on structural and textual context

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Abstract—In this paper, We propose a geometric method who use implicitly of textual and structural context of XML elements and we are particularly interested by improve the effectiveness of various structural factors for multimedia retrieval. Using a geometric metric, we can represent structural information in XML document with a vector for each element. Experimental evaluation is carried out using the INEX 2007, ImageCLEF 2010 and 2014. The results show that integration of structural context significantly improves compared results of using a single textual context.

Keywords—Structural context, Textual context, Approximative resolution, XML element, Image retrieval

I. INTRODUCTION

In this article, we focus on techniques for multimedia retrieval based on textual and structural context in XML documents. This type of document includes textual information and structural constraints. So, XML document cannot be effectively exploited by classical techniques of information retrieval, which regard document as a plane source of information. The implicit incorporation of multimedia elements in XML documents requires the exploitation of textual context for multimedia retrieval. However, the textual context remains insufficient in most of time. The idea is to calculate the relevancy score of media element based on information from the textual and structural context to answer a specific information needs of user, expressed as query composed of set of keywords. Our main inspiration is to use the structure to involve each textual information depending on its position in XML document, that is textual information that gives the best possible description of multimedia element. In our work, we will be interested by media "image".

II. PROPOSED APPROACH

We propose a new metric for multimedia retrieval in XML documents which involves the use of geometric distances to calculate the relevance of each node from the multimedia node. This method consists of placing the nodes of XML document in Euclidean space and define each node by a vector of coordinates to calculate then the distance between each pair of nodes. This distance will play a beneficial role in to calculate the score

of multimedia element. Thus, it facilitates the presentation of information in terms of interpretation and exploitation. Replying to this need, we propose a new method in the field of multimedia retrieval that takes into account the structure as a source of evidence and its impact on search performance. We present a new source of evidence dedicated to multimedia retrieval based on the intuition that each textual node contains information that describes semantically a multimedia element. And the participation of each text node in the score of a multimedia element varies with its position in there XML document. To compute the geometric distance, we initially place the nodes of each XML document in an Euclidean space to calculate the coordinates of each node by a detailed algorithm in our paper [1]. Then, we compute the score of a multimedia element depending on the distance between each textual node. We evaluate our system into three databases extracted from three collections : INEX 2007 (Initiative for the Evaluation of XML Retrieval) Ad Hoc task, ImageCLEF 2010 Wikipedia image retrieval task and ImageCLEF 2014 Plant task. The first two databases are composed by XML documents extracted from Wikipedia. The latest dataset is collected by scientific community for testing and validation of their approaches.
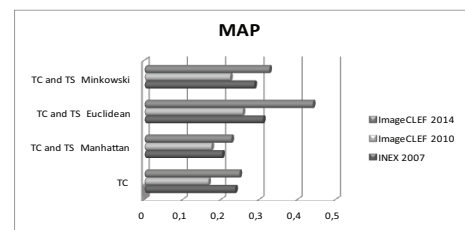

Fig. 1. Results of impact our approach on INEX 2007, ImageCLEF 2010 and ImageCLEF 2014 based in MAP(Mean Average Precision).

III. CONCLUSION

In this work, we studied the impact of textual and structural context on multimedia element retrieval, where the user need can be a multimedia element (text). We plan to investigate the impact of a mixture of text and multimedia element (text + image) with to using visual descriptors.

REFERENCES

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