J Comput Eng Inf Technol 2016, 5:4(Suppl)
http://dx.doi.org/10.4172/2324-9307.C1.006



3rd International Conference on
Big Data Analysis & Data Mining
September 26-27, 2016 London, UK

## Topological aspects in formal concept analysis

**Elisabeth Restrepo-Parra, Juan Carlos-Riaño-Rojas** and **Johana Ramírez Gaviria**
National University of Colombia, Colombia

This work presents a theoretical development from a topological approach to formal concept analysis (FCA). This seeks to combine the FCA and a topological study, which enables find information in tables underlying binary and fuzzy data, and hidden information without the use of topological tools. We proposed a method for the analysis of data more accurately in contrast to using only FCA. The basic theorem on concept lattices ensures that formal concepts have complete lattice structure, is discussed alongside the main results of FCA as an area of applied mathematics on databases. The topological structure for formal contexts is proposed from topological basis for the set of objects and attributes. With this in mind to determine relationships between objects and attributes, some topological operators such as interior, closure and boundary for the data were characterized. The continuity between formal contexts with its topological structure was also studied and it describes the representation of formal context as a bipartite graph and the topologies of its associated lattice. We presented a generalization for fuzzy formal concept analysis (FFCA) showing that the results of the classical FCA are preserved and it has extended the topological structure from binary case to fuzzy case. Finally, we applied our methodology in examples of the state of the art. The conclusions were presented, including the fact that knowing the formal concepts of a context, you can quickly extract the topological bases proposed to provide topological structure for the table, also concluded that the generalization for fuzzy data is possible, but has great limited by the lack of specialized software to perform the necessary computations. As possible future work, we propose to develop algorithms for computations in fuzzy large volumes of data, using other topologies and exploring more relationships between the FCA, lattice, graph and topology theory.

erestrepopa@unal.edu.co

## Algorithm for information retrieval optimization

**Kehinde Kayode Agbele**
Elizade University, Nigeria

When using Information Retrieval (IR) systems, users often present search queries made of ad-hoc keywords. It is then up to information retrieval systems (IRS) to obtain a precise representation of user's information need, and the context of the information. This paper investigates optimization of IRS to individual information needs in order of relevance. The study addressed development of algorithms that optimize the ranking of documents retrieved from IRS. This study discusses and describes a Document Ranking OPTimization (DROPT) algorithm for information retrieval (IR) in a web-based or designated databases environment. Conversely, as the volume of information available online and in designated databases are growing continuously, ranking algorithms can play a major role in the context of search results. In this paper, a DROPT technique for documents retrieved from a corpus is developed with respect to document index keywords and the query vectors. This is based on calculating the weight (*wij*) of keywords in the document index vector, calculated as a function of the frequency of a keyword *kj* across a document *di*. The purpose of DROPT technique is to reflect how human users can judge the context changes in IR result rankings according to information relevance. Our technique for IR optimization is generic for ranking retrieved documents. This paper found out that it is possible for DROPT technique to overcome some of the limitations of existing traditional (*tf*×*idf*) algorithms via adaptation. A context-based IRS is developed whose retrieval effectiveness is evaluated using precision and recall metrics. The results demonstrate how to use attributes from user interaction behaviour to improve the IR effectiveness.

agbelek@gmail.com