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A NOVEL TECHNIQUE FOR RESEARCH PROPOSAL CLASSIFICATION

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ABSTRACT
Research paper selection is a crucial decision-making activity for government funding agencies and research institutes. Ontology is a knowledge repository that defines ideas, terminology, and the relationships between them. In this study, Ontology is a collection of previous research papers including keywords and their frequency in funding agency research papers. Ontology improves the effectiveness, efficiency, and interactivity of activities involving searching for comparable text patterns. The present work grouping algorithm for research paper selection is based on keyword similarities and ontology research paper frequencies. Text mining is the process of extracting relevant, and sometimes previously undiscovered, information from huge documents. The Research Papers in each domain are grouped using text mining techniques. Grouped research papers are systematically assigned to the relevant reviewer or subject matter experts for peer assessment. Reviewer results are gathered, and publications are evaluated according to the findings of expert reviews.

KEYWORDS: Ontology, Text Mining

INTRODUCTION
Many organizations, such as funding agencies, choose institution research projects on a regular basis. A funding agency issues a request for proposals (CFP), which initiates several procedural chores. It is a really difficult procedure work. The CFP is being sent to relevant communities, such as universities and research institutes. The research ideas are submitted to the institution and funding agency, afterward they are assigned to specialists for peer evaluation. After compiling the evaluation results, the concepts are ranked according to the total of the expert review outcomes.

The applications are initially submitted to China's National Natural Science Foundation (NSFC).Arranging the recommendations and allocating them to reviewers is the next crucial stage. Each category's proposals should have similar traits. For instance, manual categorization based on keywords included in proposals may be used if the proposals in a group are related to the same major research topic (such as supply chain management) and the number of proposals is restricted. It gets difficult to manually arrange recommendations, though, if there are a lot of them. There are various text-mining algorithms for clustering and classifying texts. Chinese text cannot be processed efficiently by TMMs (Text Mining Methods), which are designed to handle English language. An ontology-based TMM (OTMM) is suggested as a solution to the above listed issues.

Ontology is a repository of knowledge that describes concepts, words, and their connections. It is made up of a set of ideas, axioms, and connections that explain a sphere of interests and constitute a shared understanding of the domain's "real-world" environment. Ontology [8][9] makes implicit human knowledge apparent for machines. Ontologies can therefore automate text mining and information processing in a particular field (e.g., research project selection).

RELATED STUDY
In research and development project management, choosing a research topic is a crucial step in the project selection process. For this solid conclusion, prior study suggestions with particular subjects, as well as various formal approaches and models, are obtained. Xu Wang, Frank Van Harmelen et al.[1] The innovative problem of domain categorisation for research datasets has been defined in this study.

We conducted a number of tests using ontology-based classifiers as well as but also with a basic domain-name classifier, to evaluate different classifier techniques' performance. Our unexpected discovery is that, when it comes to categorising the research domain for a set of datasets for which we had gotten gold standard responses, our experimental results demonstrate that the basic domain classifier strategy performs better than all ontology-based approaches. This goes against what we first thought, which was that a rich vocabulary found in a top-notch domain-specific ontology would provide a stronger classifier than only the research domain's single word name. Christine Lahoud, Nader N. Nashed, et al. [2] In this work, present a method for integrating data for three conceptual aspects in a teaching context using educational ontologies: learning resources, educational institutions,

and the environment. To ensure the degree of correctness of the environment and institution descriptions, we choose datasets from official sources. Regarding the resource data, we choose research datasets based on the degree of usefulness and inclusiveness while taking selection criteria into account. The D2RQ Platform, which provides a mapping method between relational and ontological data, is then used to publish the integrated data as linked data.For instance, an article by S. Bolechdren, p. Camino et al. was published [3]. A significant problem when developing systems for knowledge management and related tasks is the exploitation of knowledge in textual materials. We have proposed a framework in this study. The initial step is instinctive. Ontology is a field that may be built or expanded in a semi-atomic way using language processing techniques and machine learning algorithms. This method used the ONTO module to perform text to this OTTO from the framework. Second, ontology-related background knowledge improved the performance of traditional text mining tasks like text grouping and classification. A paper by [4] N.Arunuchalam was published. "An ontology-based text mining framework for R&D project selection" by E. Sathaya et al. An ontology mining approach for classifying research proposals and systematically allocating group proposals to reviewers was given in this publication. An ontology for research was developed to classify idea concepts from many fields of study and their relationships. With the use of a knowledge-based agent, it assigns research proposals to reviewers after clustering them according to their similarity, utilising the scenario approach to its fullest potential.[5]Yiheng Chen and Bing Qin et al. wrote a study.In the study "The Comparison of SOM and K-means for Text Clustering," two algorithms are compared.

PROPOSED WORK

The OTMM contains four phases, as seen in Fig. 3.2, and is utilised in conjunction with statistical methods and optimisation models. Phase 1 begins with the establishment of a research ontology based on keywords that includes the projects supported in the last five years. This ontology is updated annually. The new research ideas are then categorised by disciplinary areas (phase 2) using a sorting algorithm. The new suggestions in each field are then grouped using the self-organised mapping (SOM) method once the ontology has been addressed (phase 3). If there are still a lot of proposals in each cluster, they will be further divided into smaller groups in step 4, where the attributes of the applicants are taken into account (For example, candidates' associations within each proposal group should be diverse). This may be a highly complicated optimisation issue, and one solution approach that may be used is the Genetic Algorithm.

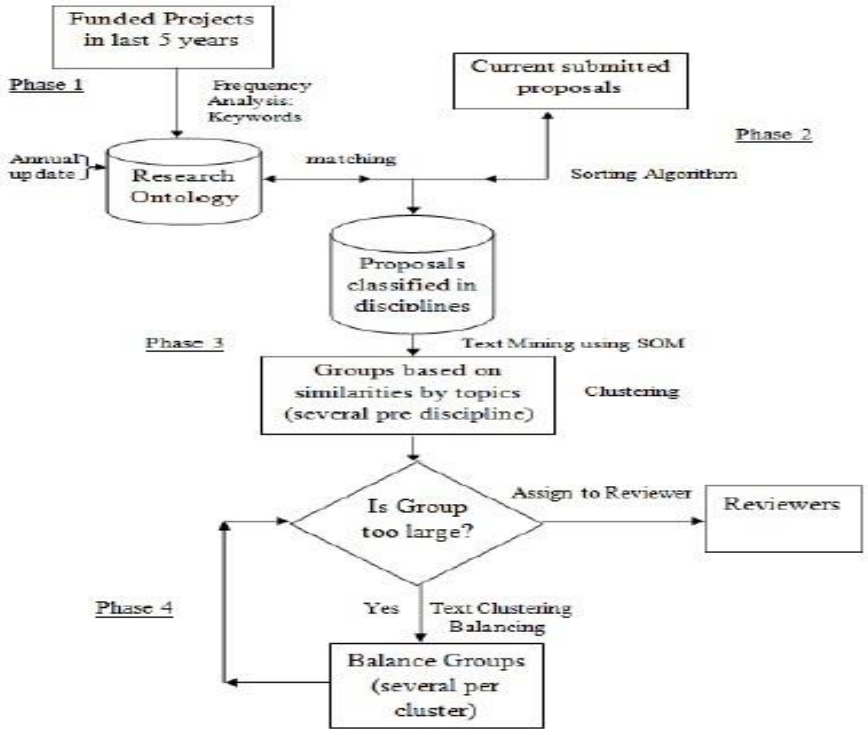

Figure: 1 Process of OTMM [1]

RESULTS ANALYSIS

In this section, performance of proposed system evaluated.

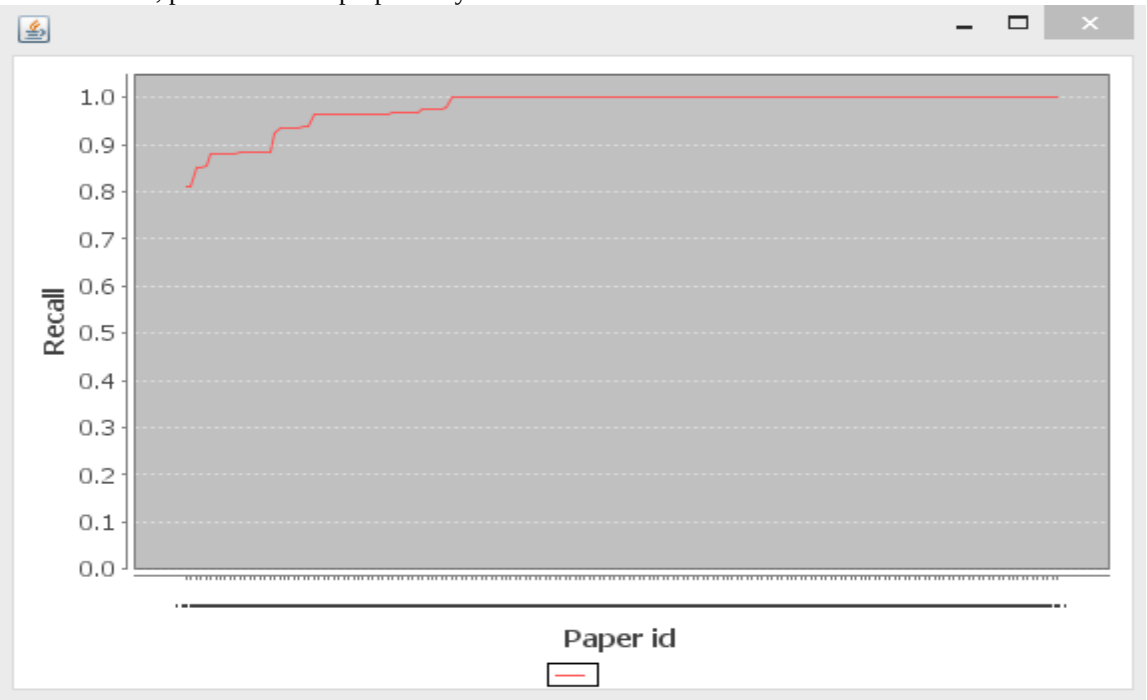

Figure 4.1 Recall based on paper id

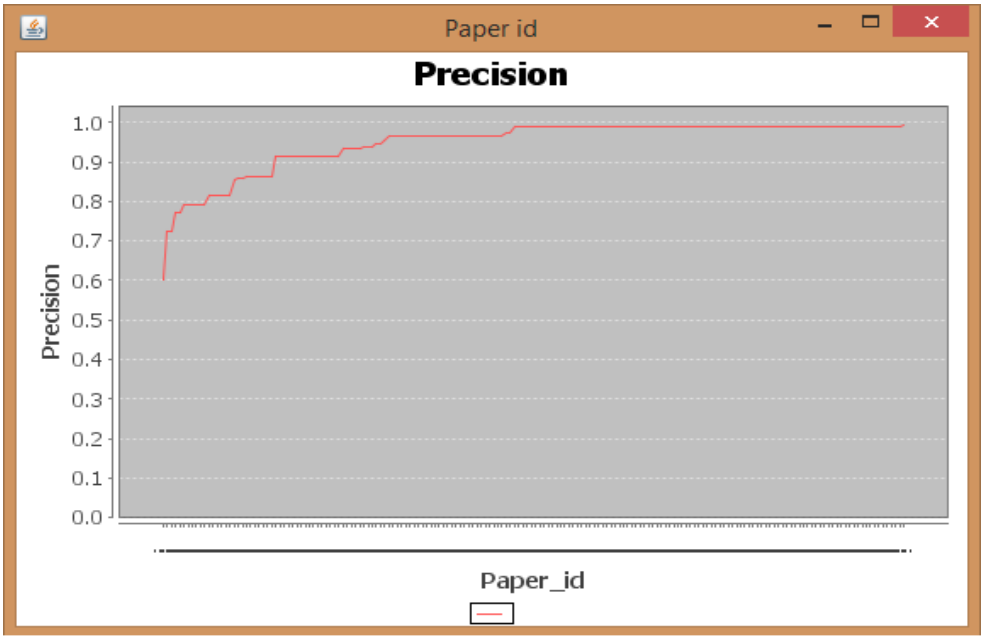

Figure 4.2 Precision based on paper id.

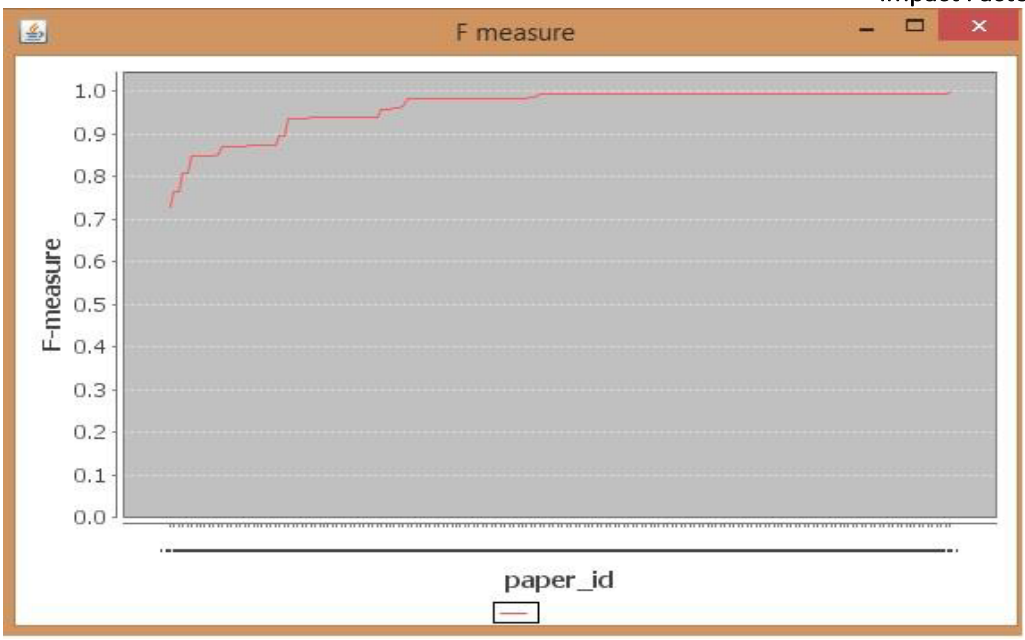

Figure 4.3 F-measure based on paper id

CONCLUSION

This research work has been used to create an OTMM for categorising research proposals. Research ontology's objective is to classify concepts and ideas from many disciplines and create links between them. By classifying research ideas based on their similarities and then balancing them based on the credentials of the applicants, it facilitates TMM and optimisation procedures. The results of the NSFC experiment showed that the recommended method enhances equality in group suggestions and evaluates applicants' attributes. Furthermore, the proposed approach promotes efficiency in the proposal classification process. The proposed approach may potentially be used by other government research financing organizations dealing with information overload.

To categories idea concepts across different disciplines and establish connections between them, research ontologies are created. study ideas are grouped based on their equality using text-mining and optimisation techniques, and they are then assigned or allocated to reviewers according on the study topic they are interested in. A knowledge-based agent assists in assigning the suggestions to the reviewer

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