



## DESIGNING OF FAIR REVIEWER ASSIGNMENT IN PEER REVIEW

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**Abstract**—One of the normal issues looked in allocating recommendations submitted to the conferences, journal publications and so forth is the assignment of the proposition to the suitable reviewers. This is likewise named as the reviewer assignment issue. Here, where the skill level of a reviewer who is engaged with reviewing a proposal ought to be streamlined to ensure the choice of the best reasonable proposal. Picking a suitable reviewer includes the mastery as well as thinks about assorted variety and irreconcilable circumstances among them. Toward this path, various arrangements have been given by researcher previously, yet a portion of the issues continues in this field. The proposed system features a review on the current strategies proposed by the analysts to tackle the reviewer assignment issue and different keyholes in the current situation alongside the potential arrangements.

**Keywords**— *Information Retrieval, Journals, Conferences, Reviewer Assignment*

### INTRODUCTION

The way toward doling out a reviewer to a proposal is considered as a troublesome and testing task for different research organizations and associations. The procedure is for the most part named as Reviewer Assignment Problem (RAP) whose initial step is to send calls for recommendations accommodation. The proposal is submitted to the calling associations. The fair assignment of accommodation to reviewers is finished utilizing the most broadly utilized CMS (i.e., Conference Management Toolkit and Easy Chair) which relegates the papers dependent on reviewer offering inclinations. In any case, the significant down side of this approach is that specialists for the most part adhere to the directions and guidelines of the financing organization for reviewing the proposition and don't offer significance to titles and modified works by and large. In light of the review done, certain collection techniques are utilized to arrange the outcomes according to their rankings Sun et al., 2008. Prior, the errand of appointing the papers to the reviewers was taken care of by a little board of trustees of individuals physically.

The manual assignment of proposition takes additional time and overhead. It is an emotional methodology and is focused principally on the choice and assessments of the individuals from the board of trustees. The improvement of assignments was a difficult errand as every one of the imperatives couldn't be considered productively. A total scope of research points and subtopics is determined before the accommodation procedure starts, and all reviewers are solicited to indicate their territory from skill. Likewise creators are additionally approached to determine the space to which their paper applies. This built up an affiliation connect among reviewers and papers. It can once in a while bring about wrong coordinating from the meeting points also, can be deluding as for the real point of their proposition. In this way, to battle the circumstance, it is required to make the procedure of assignment of recommendations automated to decide the paper points naturally as opposed to physically. The problems faced in traditional methods gave rise to an automatic mechanism.

for the reviewer assignment. Dumais and Nielsen in 1992 addressed the problem by using Latent Semantic Indexing (LSI). As the complete idea of modeling the reviewer assignment is quite large in its stature, different and all kinds of learning methods are used to solve problems efficiently.

### RELATED WORK

Huanli Pang<sup>1</sup>, Le Liu<sup>2</sup>, et. al.[1] Proposed a system, peer review as an evaluation of paper quality of "Science paper Online", it is an important link of its quantity. Due to the peer review is natural language, use semantic neural network quantized peer review is put forward in this paper. That, parsing the surface semantic analysis of peer review to establish the semantic neural network, and the deep-seated semantic computing of peer review, wins the quantized result finally.

Haifeng Li, Ning Chen, et. al. [2] proposes a topic Peer review expert selection is an important link of fund project review; it can not only improve the matching accuracy of domain experts and projects, but also improve the appraisal quality in fund project review. This paper mainly studies the peer review expert selection method in fund project review. With the actual experience of fund project management, based on the author's knowledge set theory, paper analyzes deeply knowledge set representation of expert knowledge, improves the similarity calculation of expert and project knowledge, builds the peer review expert selection method, and gives the actual example.

Kay Berkling, et. al. [3] proposes a technique to perform Peer Reviews between students in higher education is the topic of this paper. By integrating this instruction method into university classroom activities, students train meta-skills and self-reflection, encouraged not only through giving constructive feedback to others but also by reflecting critically on received feedback for their own projects. Methodically, we analyzed over 500 peer reviews in a project-based two semester long Software Engineering class. First, the gamified set-up of the class design is described because the peer review constitutes an integral part thereof. The process of peer reviewing is then reported in detail, including a transcript of an interaction. Finally, we look at the content of peer reviews that are used to improve homework and estimate the number of improvements in the final project handin. It can be shown that the peer review contributes in a positive way to students' learning experience and the quality of their final hand-in.

Dr. Kunwar Singh Vaisla ,et.,al.[4] proposes a This paper dive into various methods for providing solutions to assignment of experts to proposals using different techniques. As the reviewers have varying levels of expertise in different domains which can be the reviewers having different degrees and levels of expertise in different domains combine to form a crisp set which can in turn give incorrect or misleading information. We have also observed that it may not lead to matching of exact expertise of a reviewer with that of the proposal submitted. RAP itself is a complex and complicated task. Finding an appropriate journal for the proposal is even more cumbersome. A comprehensive study is presented here for the methods that have been proposed earlier with issues that are challenging in this field. A clear understanding of the challenges is, thus, necessary to solve such problems. odriguez MA et, al.[5], In RD project selection, experts (or external reviewers) always play a very important role because their opinions will have great influence on the outcome of the project selection. It is also undoubted that experts with high expertise level will make useful and professional judgments on the projects to be selected. So, how to assign the most appropriate experts to the relevant proposals is a very significant issue. This paper presents a hybrid knowledge and model approach which integrates mathematical decision models with knowledge rules, for the assignment of experts to review of RD project proposals. The approach can be applied to government funding agencies in China and other countries.

Pazzani MJ, et. al, \*6+ "Sciencepaper Online" as only issued and spread channel by means of Internet, the whole procedures carry on in the network environment, example, contributing, reviewing, editing and publishing, reading, even reader feedback. And searching, browsing, printing and download have been achieved. It's belong to pure network periodical. All links of this network periodical connected by electronic data, as metarial and medium by network. The short cycle of editing and publishing, the change of review mechanism, the freedom of periodical's publication, everyone is periodical's producer, thus lead to a series of problems such as periodical quality, influence acceptable levels for its academic authority, affect authors' intention for contribution. Therefore, it's imperative for control the quality of periodical.

Nielsen J, et. al.[7], proposes The process of assigning a reviewer to a proposal is considered as a difficult and challenging task for various research agencies and organizations. The process is generally termed as Reviewer Assignment Problem (RAP) whose first step is to send calls for proposals submission. The proposals are submitted to the calling organizations. The fair assignment of submission to reviewers is done using most widely used CMS (i.e., Conference Management Toolkit and Easy Chair) which assign the papers based on reviewer bidding preferences.

Sun YH, et.al.[8] proposes a study on Peer-reviewed have two key factors in determination of evaluation standards and peer designed domain experts, and the election of the domain expert is very important and very difficult work, especially like technology project evaluation, project, the project of large quantity, scattered experts widely, but also related field many questions are the frontiers of science question which specially selected domain experts more difficult. Peer review experts selected process is the rational matching process between projects and domain experts, we can use knowledge set method for said for projects and domain experts matching.

## II. ANALYSIS AND PROBLEM FORMULATION

Reflecting Peer Reviews in Inquiry Based Learning Scenarios, Group dynamics and clear schedules are other important factors for the students to effectively improve their papers and learn from each other, Many times experts have multidisciplinary research areas, with varying degree of significance. Sometimes, experts are not able to give complete information about their different areas of expertise manually.

Boosting Student Performance with Peer Reviews; Integration and Analysis of Peer Reviews in a Gamified Software Engineering Classroom, This system will describe the process of peer reviews in a Software Engineering classroom at the Cooperative State University. Random selection of keywords from the given proposal may sometimes lead to ignorance of some of the important keywords which are not directly present in the paper.

Peer Review Expert Selection Method Research Based on Knowledge Set Theory, improves the similarity calculation of expert and project knowledge, builds the peer review expert selection method, and gives the actual example. In RAP, the

assignment of appropriate journal for the paper is rarely studied. The reviewer can be associated with various journals having different

scope, so even after assigning the reviewer to proposal, the suitable journal not matches.

Quantized Peer Review Based on Semantic Neural Network, parsing the surface semantic analysis of peer review to establish the semantic neural network, and the deep-seated semantic computing of peer review, win the quantized result finally. No certain techniques to redefine the query can be applied to expand the set of keywords which can lead to inclusion of some additional and relevant keywords to the bag of selected keywords.

### V. PROPOSED METHODOLOGY

#### A. Architecture

Knowledge base Knowledge rules are designed for classification of discipline areas, external reviewers and proposals, avoidance of conflicts of interests and improvement on the effectiveness of reviewer assignments. Model base Decision models are mainly designed for the following two tasks: identification of the expertise level of external reviewers, and assignment of external reviewers to proposals.

Database There are two major categories of data stored in the database: human resource data, and proposal data. Human resource data consists of those for Internal Manager, External Expert, and Applicant. Internal Manager consists of Top Manager, Department Manager, and Division Manager. External Expert consists of External Reviewer, and Panel Expert. Applicant consists of Individual Applicant and his/her affiliated Organization. Each Individual Applicant should have an affiliated Organization. Individual Applicants submit proposals through their affiliated Organizations to the funding agency. Internal Manager maintains a list of External Experts for different decision-making tasks.

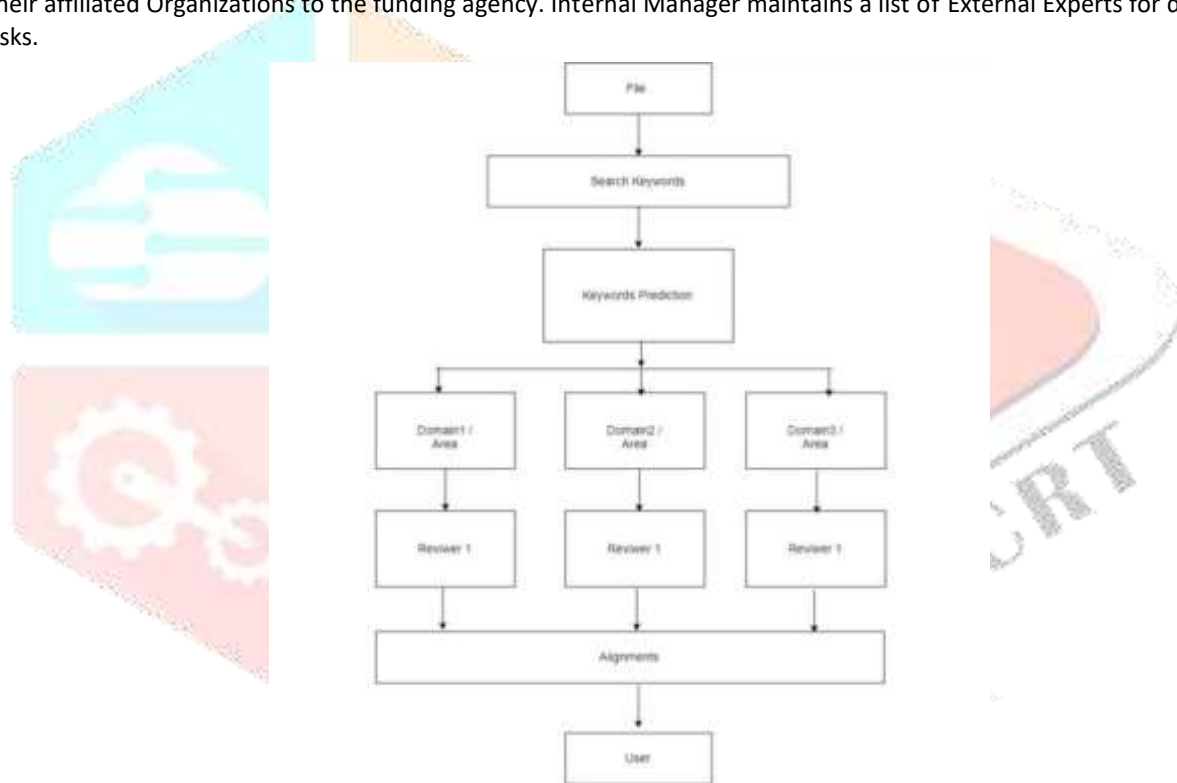
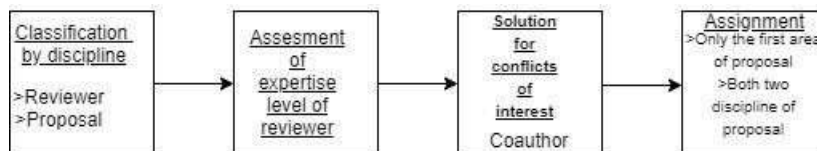


Fig (A) System Architecture

#### B. System Working:



Fig(B) System Design

The data processing is mainly described in following 4 sections:

### 1. Classifying reviewers and proposals according to discipline areas:

As mentioned above, reviewers and proposals are classified by the discipline areas they belong to. Under each discipline area, there are corresponding reviewer and proposal sets. That is, we can classify reviewers and proposals through the discipline areas they declared. Figure illustrates the sample rules for reviewer classification. The situation is very similar for proposal classification.

### 2. Assessing expertise level of reviewers:

Determination of the expertise level of any reviewer in a specific area has been a research concept in the literature related with human science, education science and other similar areas. To determine the expertise level, NSFC asks all reviewers to fill in a form related with the discipline areas of their professional subject, and of their published papers. Then with a counting procedure, a level between 1 and 3 is assigned to each reviewer to indicate their expertise. Level three represents reviewers are very familiar with the corresponding area, level two familiar, and level one less familiar respectively.

### Solving conflicts of interests between reviewers and applicants:

In order to obtain objective and fair evaluation of the proposed projects, the conflicts of interests between applicants and reviewers should be avoided. For example, the affiliation of the applicant should not be the same as that of reviewer. Applicants and reviewers should not be the coauthor which indicates that they had cooperated in research before. These knowledge rules can be abstracted from NSFC guidebook to form a rule base.

### 3. Assigning reviewers to proposals:

After three steps above, we have got the pool of qualified reviewers for proposals. Recall that the research problem is to let the most qualified referees to review proposals. That is, choose the assignment that maximizes the total expertise level of the reviewers. As mentioned above, different reviewers have different expertise levels in a discipline area, and a reviewer may declare several discipline areas; at the same time, each proposal is required to declare two discipline areas. Furthermore, both funding agencies and applicants hope that proposals can be evaluated according to their first discipline areas if possible, because the first area of proposals represents the highest degree of match between proposals and discipline areas. So, proposals should be assigned to reviewers according to their first discipline area firstly. In such case,  $ij_2 c$  will be set as zero. Model (p1) will be used to find the solution. If there is no optimal solution, then slack the constraint, and let  $ij_2 c$  restore their original value. Model (p2) will then be used to help solve this problem. If the optimal solution still doesn't exist, NSFC will invite new experts to enter the reviewer database and find the best solution once again.

## V. RESULT AND ANALYSIS

The system is implemented using ASP.NET on Windows 10 operating system. For Implementation core I5 system with 4gb ram is used.

### A. Dataset:

**TABLE 1 : DATASET DESCRIPTION**

#	Drone Dataset
Title	500
Author	80
Keywords	2150
Reviewer	12
Assignment	185
Domains	25

### B. Performance Measures:



Number of Documents	File Extraction Time(in Sec)	File Prediction time(in Sec)	Classification Accuracy
1	9.23	3.94	0.86
2	21.43	4.21	0.81
3	29.32	4.54	0.76
4	36.43	5.2	0.71
5	44.23	5.45	0.68

#### Results:

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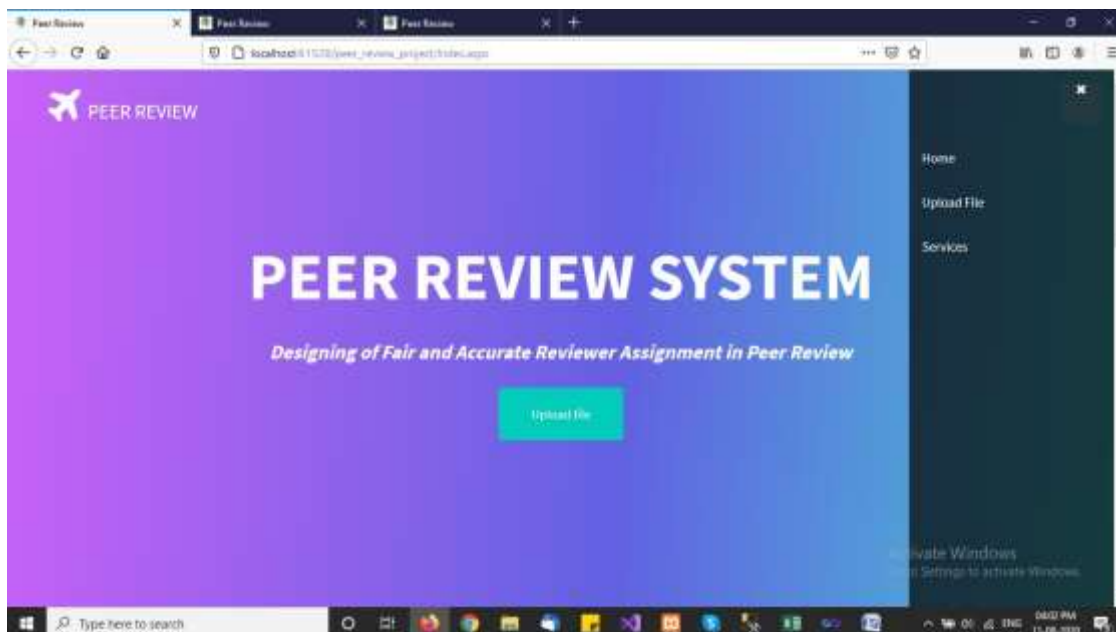


Fig : File Uploading



Fig : Keyword Prediction

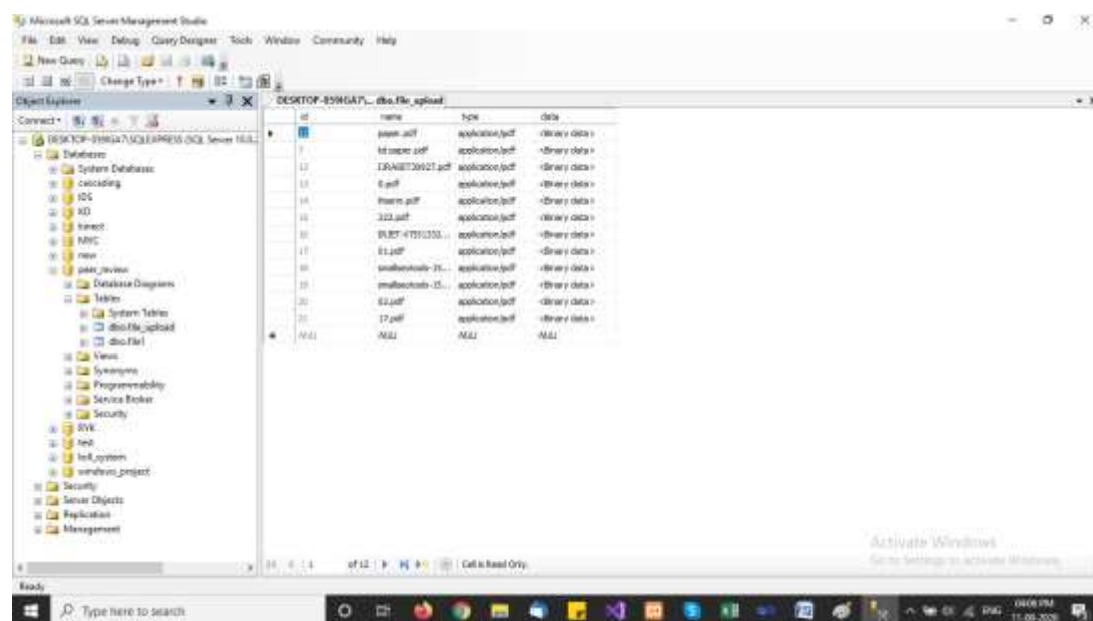


Fig: Database Design

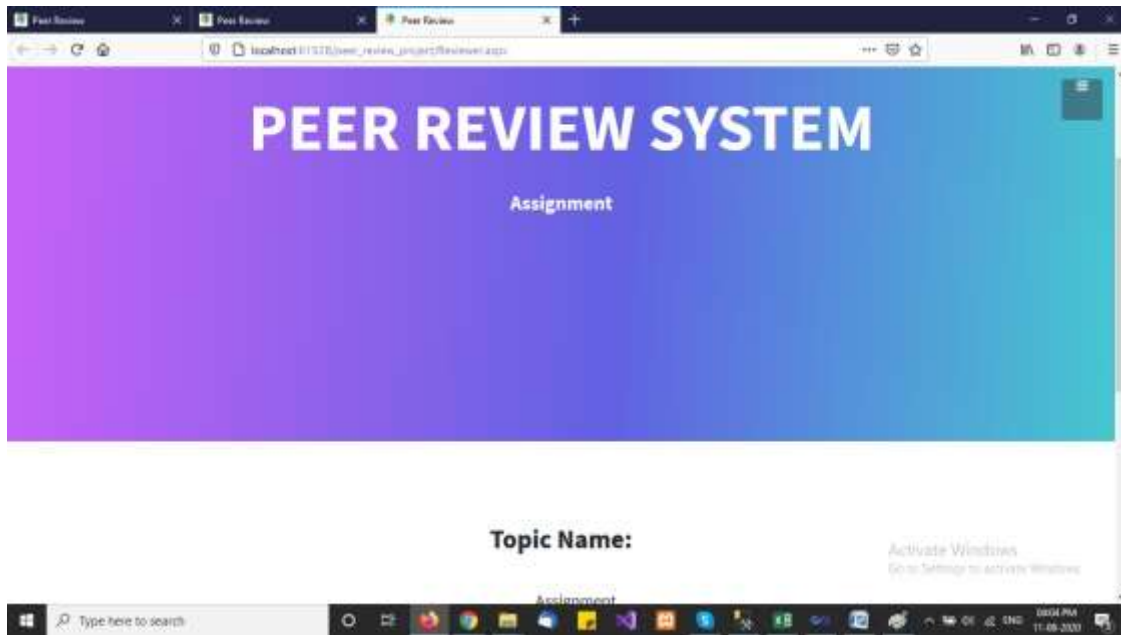


Fig : Domain Selection



Fig : Assign Assignment

This system dive into various methods for providing different techniques. As the reviewers have varying levels of expertise in different domains which can. The reviewers having different degrees and levels of expertise in different domains combine to form a crisp set which can in turn give incorrect or misleading information. We have also observed that it may not lead to matching of exact expertise of a reviewer with that of the proposal submitted. RAP itself is a complex and complicated task. Finding an appropriate journal for the proposal is even more cumbersome. A comprehensive study is presented here for the methods that have been proposed earlier with issues that are challenging in this field. A clear understanding of the challenges is, thus, necessary to solve such problems.





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