A System to Connect Patient to Doctor

Milind Rao Pawar[1]*, Mahesh G. Huddar[2], S. B. Hosgoudar[3]

[1]Asst. Prof., Department of Computer Science and Engineering, Hirasugar Institute of Technology, Belagavi, India

[2]Asst. Prof., Department of Computer Science and Engineering, Hirasugar Institute of Technology, Belagavi, India

[3]Asst. Prof., Department of Computer Science and Engineering, Hirasugar Institute of Technology, Belagavi, India

Abstract – In day today life human beings may came with health related issues, if the person is unknown about the doctors in particular city then it's very difficult to find the doctor for consultation. This paper produces a novel approach which helps the patient to search doctor. Global Relevance Recommender System concept has been adopted for recommending doctor to the patient.

Keywords - Similarity Measure, K-NN Classifier, Global Relevance, Pearson Correlation.

-------------------------◆----------------------------

1. INTRODUCTION

The main desire when experiencing a health problem is to find a doctor or hospital with the best expertise for solving our health condition. This paper presents a recommender system that helps users to find solutions for their health related issues by suggesting doctor for a specific patient profile. For the given patient profile it generates the ranked list of suitable doctors, system recommends the similar patients by looking how they give ratings to the particular doctors and comparing patients symptoms based on doctors specialization. The main goal of this system is to sharing knowledge, finding similar patients, looking at doctor's specialization with his experiences.

2. LITERATURE SURVEY:

In 1998, *Giles et al.* introduced the first research-paper recommender system as part of the *CiteSeer* project [1]. Since then, at least 216 articles relating to 120 research-paper recommendation approaches were published. The amount of literature and approaches represents a problem for new researchers: they do not know which of the articles are most relevant, and which recommendation approaches are most promising. Even researchers familiar with research-paper recommender systems would find it difficult to keep track of the current developments, In the last sixteen years, more than 200 research articles were published about *research-paper recommender systems*. By reviewing these articles, a discussion about the major advancements, shortcomings and an overview of the most common recommendation concepts and approaches found several classes of recommender system. Those are content-based filtering, collaborative filtering, graph-based, stereotyping, global based and hybrid recommendations [3].

Evaluating recommender systems requires a definition of what constitutes a good recommender system, and how this should be measured. There is mostly consensus on what makes a good recommender system and on the methods to evaluate recommender systems [8].

Global Relevance is simplest form, which adopts a one-fits-all approach and recommends items that have the highest global relevance. In this case, the relevance is not calculated specific to a user, for example based on the similarity of user models and recommendation candidates. Instead, some global measures are used, such as overall popularity. For instance, a movie-rental system could recommend those movies that were most often rented or that had the highest average rating over all users. In this case, the basic assumption would be that users like what most other users like [3].

3. PROPOSED SYSTEM:

The proposed system will have features to manage doctor list according to their specialization. Patients will have facility to select different symptoms, based on the similarity of patient symptoms and doctors specialization to handle the particular patient, system will generate the results in the form of doctors' name.

Patient can search for doctors online, according to their symptoms. There is a facility for patients to lake appointment after concentration, doctor can generate prescription.

3.1 System Overview

Admin: Admin should use user-id password to login. After login the admin page will display, it consist of Doctor (add student) and logout. Admin will add all doctor's information like Name, Address, Mobile Number, Age, Gender, mobile number. Admin will collect all the doctor details and store into database.

Doctor: Doctor should use user-id and password provided by Admin to login. After login Doctor can see his own profile. He will approve the appointments by patients who requested for him. Doctor can give prescription to the particular patient.

Patient: Patient will register for the system after that he will search for doctors by selecting symptoms that he suffering. After selecting symptoms he will get doctor list according to his disease, he will choose doctor and he can request appointment for that doctor. After cure patient can give appropriate rating to particular doctor. Patient will have login and logout options.
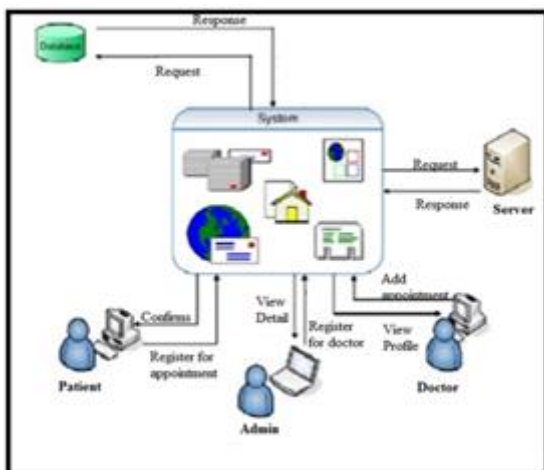
3.2 System Architecture:

Figure 1: System Architecture for Connecting the Patient to Doctor.

Figure1 depicts the system architecture of Recommender System for Connecting Patients to Doctors. The application consists of admin, Doctor and Patient. Admin can maintain, create and update the data and if he need the data then even he can retrieve the data whenever it is required. The doctor can view his profile and add appointment details. Patient will search for doctors according to recommendation provided by previous similar patients.
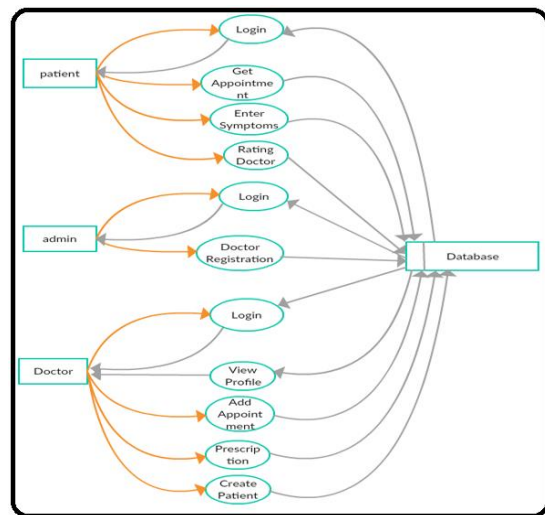

Figure 2: Data Flow Diagram for Connecting the Patient to Doctor.

Figure2 describes data flow diagram comprises of the different modules such as Admin, Doctor and Patient, where the admin can insert the details into the database and also retrieves the information as and then required. The doctor can view his profile and add appointment details and he can add prescription. Patient can search the doctor by seeing doctors rating. After curing his disease he can give the rating to that particular doctor and that rating can be updated in that particular doctor profile.

4.   METHODOLOGY

4.1 Connecting Doctor:

The following steps are use to find doctors by matching the features (symptoms) given by the patents.

1)   Based on the Priori knowledge database has been created for the doctor related information. For each specialization, symptoms are assigned.

2)   For each patents minimum three and maximum five symptoms are assigned in the dropdown menu. And these information's are inputted by Patents only. And these are considered as features for further processing.

3)   Symptoms are grouped in such a way that each group forms the cluster and each cluster points to specific specialization and to the respective doctor.

4)   K-NN classifier is used to find nearest neighbor in such way that it will find the nearest values from the cluster. And suggest symptoms are belongings to which specialization then through which doctor.

Milind Rao Pawar[1]*, Mahesh G. Huddar[2], S. B. Hosgoudar[3]

4.2 Rating for Doctor:

Patient will give the rating to specific doctor based on the treatment and its cure to dieses.

The rating will be form the range 1(strongly dislike) and 5 (strongly like).

4.3 Similarity Measure:

According to the given rating, the system should recommend doctors for patients by computing maximum rating.

Lets consider the followings steps to measure similarity.

1) $P = \{P1, P2, P3……Pn\}$ denote the set of patents.

2) $D = \{d1, d2, d3…. dm\}$ be the set of doctors.

3) $R = n*m$ be the matrix of rating R_{ij}. Where i related to patents and j related to doctors.

4)   The possible rating values are defined on a numerical measure scale from 1(strongly dislike) & 5 (strongly like).

5)   If a certain patent has not rated a doctor j, the corresponding matrix entry $R_{i.j}$ remains empty.

6)   The Pearson correlation is used to find the similarity measured.

7)   Then the common prediction is calculated whether the neighbor's rating for the unseen patient are higher or lower than their average.

8)   Combine the rating differences using similarity with its weight.

9)   Recommend a doctor to patent.

4.4 Appointment assigning to the patent.

If patient feels to visit the recommended doctor, then patient need to book for the doctor. Based on the free slots the appointment date and time will be generated and send to patent account.

The models proposed in this paper are implemented using Java Server Pages (JSP) coding and backhand database uses MySQL.

5.   RESULTS AND ANALYSIS

During result analysis, the focus is on what needs to be done, independent of how it is done. During design decisions are made about how problems will be solved, first at high level and then at increasingly detailed levels. System design is the first design stage in which the basic approach to solving the problem is selected. System testing involves integrating two or more components that implement system functions or features and then testing this integrated system. Since implementation is done by using waterfall software development process, so system testing concerned with testing the entire system. The individual independent working components are integrated together and an entire system is tested to verify that the system components perform control and system functions efficiently.
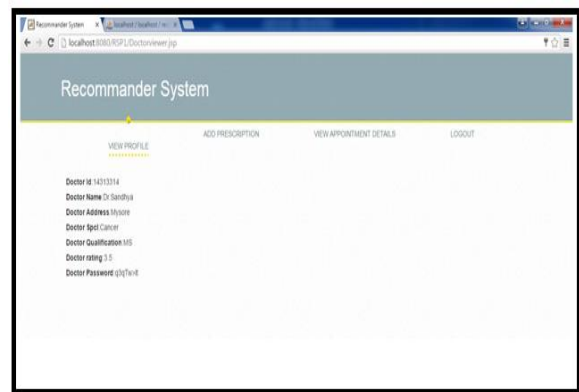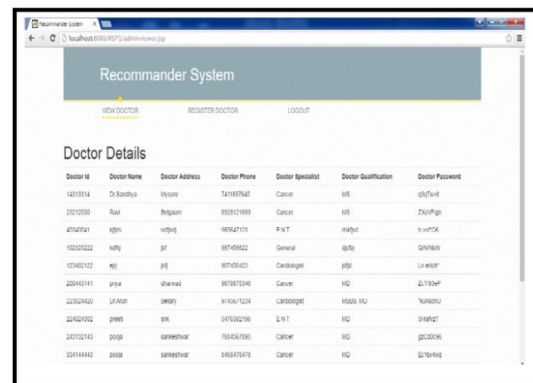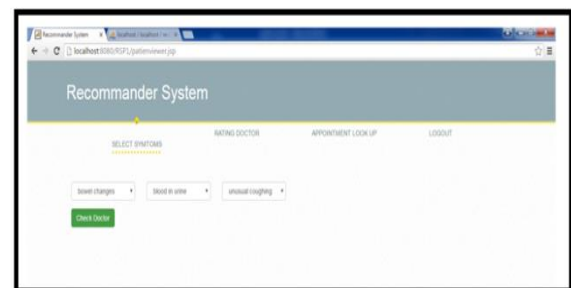

Figure3: Doctor Profile.

Figure4: Doctors Details.

Figure5: Select Symptoms.

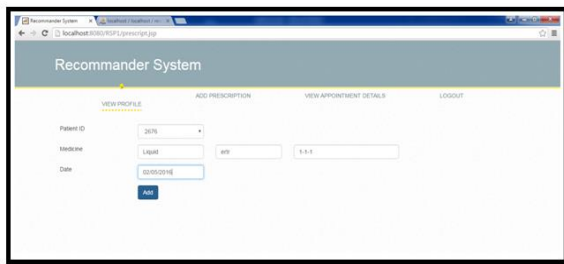**Milind Rao Pawar[1]*, Mahesh G. Huddar[2], S. B. Hosgoudar[3]**

Figure6: Prescription

In figure3, we can view the doctor profile as well as in figure4 individual doctor details. The patient will select symptoms which is shown in the figure5. Doctor can generate prescription for the patients as shown in figure6.

6.   CONCLUSION:

This paper described a recommender system for suggesting doctors to patients, based on the similarity, computed by exploiting a disease hierarchy. The recommendation is done through comparing ratings. The recommender system which helps user in finding solution for their health conditions.

7.   FUTURE WORK:

Now this idea has been implemented by using global reference and in future it can be implemented by using other techniques such as Stereotyping, Content-based Filtering, Collaborative Filtering, Co-occurrence recommendations, Graph Based, Hybrid Recommendation Approaches with advanced methodologies.

REFERENCES

B. W. Hesse, D. E. Nelson, G. L. Kreps, R. T. Croyle, N. K. Arora, B. K. Rimer, and K. Viswanath. Trust and sources of health information. Archives of Internal Medicine, 165(22):2618{2624, 2005.

M. Wiesner and D. Pfeifer. Health recommender systems: Concepts, requirements, technical basics and challenges. Int. J. of Environmental Research and Public Health, 11(3):2580{2607, 2014.

Joeran Beel, Bela Gipp, Stefan Langer, and Corinna Breitinger, "Research Paper Recommender Systems: A Literature Survey" *International Journal on Digital Libraries*, Springer Berlin Heidelberg, 26 Jul 2015. DOI 10.1007/s00799-015-0156-0.

J. Beel, S. Langer, M. Genzmehr, and A. Nürnberger, "Introducing Docear's Research Paper Recommender System," in *Proceedings of the 13th ACM/IEEE-CS Joint Conference on Digital Libraries (JCDL'13)*, 2013, pp. 459–460.

J. Beel, S. Langer, A. Nürnberger, and M. Genzmehr, "The Impact of Demographics (Age and Gender) and Other User Characteristics on Evaluating Recommender Systems," in *Proceedings of the 17th International Conference on Theory and Practice of Digital Libraries (TPDL 2013)*, 2013, pp. 400–404.

Quan Yuan, Li Chen and Shiwan Zhao. Factorization vs. Regularization: Fusing Heterogeneous Social Relationships in Top-N Recommendation. In *Proceedings of the 5th ACM Conference on Recommender Systems (RecSys'11)*, pages 245-252, Chicago, IL, USA, October 23-27, 2011.

Ho Keung Tsoi and Li Chen. Incremental Tag-Aware User Profile Building to Augment Item Recommendations. In *ACM Conference on Computer Supported Cooperative Work (CSCW'11), 2nd Workshop on Social Recommender Systems (SRS'11)*, Hangzhou, China, March 19-23, 2011.

"Research Paper Recommender System Evaluation: A Quantitative Literature Survey."

Corresponding Author

Milind Rao. Pawar*

Asst. Prof**.**, Department of Computer Science and Engineering**,** Hirasugar Institute of Technology**,** Belagavi, India

E-Mail – milindp9@gmail.com

Milind Rao Pawar[1]*, Mahesh G. Huddar[2], S. B. Hosgoudar[3]