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TERM BASED PERSONALIZATION OF FEATURE SELECTION OF AUTO FILLING PATIENT TRANSITION

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Abstract :- *Hospital is currently using a manual system for the management and maintenance of critical information of a patient. Forms are often lost in transit between departments requiring a comprehensive auditing process to make sure that no vital information is lost. Multiple copies of the same information exist in the hospital and may lead to inconsistencies in data in various data sources. A significant part of the operation of any hospitals involves that acquisition Management and timely retrieval of great volumes of information. We proposed that representation learning has become a rapidly growing of clinical handover and auto-filling areas. In this paper, we present a novel feature selection model which is capable of selecting term-based personalized features for classification. First, each feature subset is evaluated by a term-feature probabilistic relevance model. Afterwards, the feature subset with the highest probabilistic value will be assigned for the given term during classification. Since exhaustive evaluating all the possible feature subsets is computationally intensive, we apply a strategy to generate candidate feature subsets based on mutual information. Traditional methods usually treat all terms with same feature sets, such that performance can be damaged when noisy information is brought via wrong features for a given term. Different from traditional feature selection methods, Conditional Random Field (CRF) model can automatically select the most relevant features for the given term, instead of using the same features for all terms in a learning machine. In this way, we furthest eliminate the negative impact of noisy information. Our main focus is on government hospitals. Though it is already used in certain private hospitals, it helps to analyses the data and schedules according to the priority of the data sets given by patients.*

1. INTRODUCTION

Automation is everywhere emerging all over in the real-world applications. It is not only used in the medical field but also used in the organization to maintain and manage the business processes. In the Human Resource operations, interview process can be organized in an automated way by using this methodology. In robotics application, the automation is majorly used for the content filling and other purposes. This will free up the human resource overhead and the process which requires much human power will be minimized. The organization in which the process is managed by human entity, this proposed method can manage the organization with the usage of minimized efforts. This paper addressed a clinical information retrieval challenge to support clinicians in healthcare domain. We propose a term personalized feature selection model for clinical handover form auto-filling task. We show that our proposed model outperforms SVM, CRF and several ensemble methods. We also present that our model is stable and robust by comparing it with several feature selection methods. Electronic handover form with standardized and structured content provides us with a good mechanism to improve quality and safety at shift changes. CHFA can release lots of clinicians' time from documentation to care treatment and medical plan settings, since there are various contents in the handover form to be filled.

2. RELATED WORKS

Taylor, Joseph G, Sharmanska, Viktoriia, Kersting, Kristian, Weir, David and Quadrianto, Novi," Learning using Unselected Features (LUFe)"-25th International Joint Conference on Artificial Intelligence, volume.16, July 2016. Feature selection has been studied in machine learning and data mining for many years, and is a valuable way to improve classification accuracy while reducing model complexity. Two main classes of feature selection methods - filter and wrapper - discard those features which are not selected, and do not consider them in the predictive model. We propose that these unselected features may instead be used as an additional source of information at train time. We describe a strategy called Learning using Unselected Features (LUFe) that allows selected and unselected features to serve different functions in classification. In this framework, selected features are used directly to set the decision boundary, and unselected features are utilized in a secondary role, with no additional cost at test time. Our empirical results on 49 textual datasets show that LUFe can improve classification performance in comparison with standard wrapper and filter feature selection.

Yun He, Qinmin Hu, Yang Song, Liang He," Estimating Probability Density of Content Types for Promoting Medical Records Search"-European Conference on Information Retrieval, Volume.9626, March 2016. Disease and symptom in medical records tend to appear in different content types: positive, negative, family history and the others. Traditional information retrieval systems depending on keyword match are often adversely affected by the content types. In this paper, we propose a novel learning approach utilizing the content types as features to improve the medical records search. Particularly, the different contents from the medical records are identified using a Bayesian-based classification method. Then, we introduce our type-based weighting function to take advantage of the content types, in which the

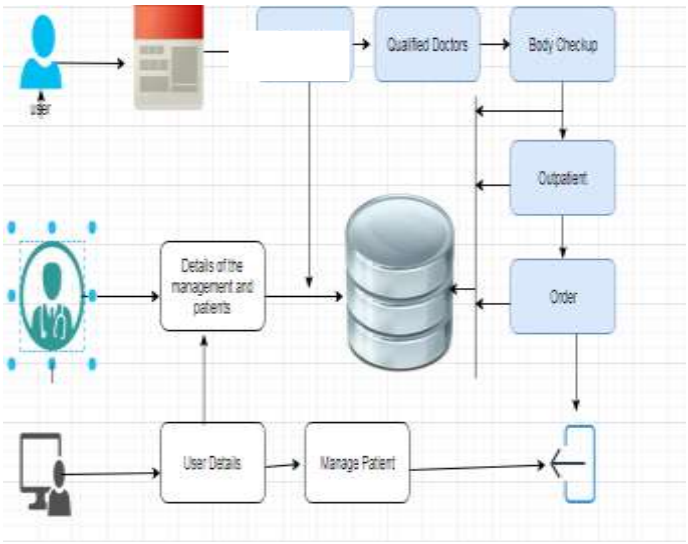
weights of the content types are automatically calculated by estimating the probability density functions in the documents. Finally, we evaluate the approach on the TREC 2011 and 2012 Medical Records data sets, in which our experimental results show that our approach is promising and superior.

Hanna Suominen, Liyuan Zhou, Leif Hanlen, Gabreila Ferraro," Benchmarking Clinical Speech Recognition and Information Extraction: New Data, Methods, and Evaluations"- JMIR Med Inform, volume.3, April 2015. Over a tenth of preventable adverse events in health care are caused by failures in information flow. These failures are tangible in clinical handover; regardless of good verbal handover, from two-thirds to all of this information is lost after 3-5 shifts if notes are taken by hand, or not at all. Speech recognition and information extraction provide a way to fill out a handover form for clinical proofing and sign-off. The objective of the study was to provide a recorded spoken handover, annotated verbatim transcriptions, and evaluations to support research in spoken and written natural language processing for filling out a clinical handover form. This dataset is based on synthetic patient profiles, thereby avoiding ethical and legal restrictions, while maintaining efficacy for research in speech-to-text conversion and information extraction, based on realistic clinical scenarios. We also introduce a Web app to demonstrate the system design and workflow. We experiment with Dragon Medical 11.0 for speech recognition and CRF++ for information extraction. To compute features for information extraction, we also apply Core NLP, Multimap, and onto server. Our evaluation uses cross-validation techniques to measure processing correctness. The data provided were a simulation of nursing handover, as recorded using a mobile device, built from simulated patient records and handover scripts, spoken by an Australian registered nurse. Speech recognition recognized 5276 of 7277 words in our 100 test documents correctly. We considered 50 mutually exclusive categories in information extraction and achieved the F1 (i.e., the harmonic mean of Precision and Recall) of 0.86 in the category for irrelevant text and the macro-averaged F1 of 0.70 over the remaining 35 nonempty categories of the form in our 101 test documents. The significance of this study hinges on opening our data, together with the related performance benchmarks and some processing software, to the research and development community for studying clinical documentation and language-processing. The data are used in the CLEF Health 2015 evaluation laboratory for a shared task on speech recognition.

3. PROPOSED SYSTEM

In the proposed system, automated filling outpatient form is introduced. By this application, the patients do not have a need for waiting in the queue for consulting a doctor or does not need much of manpower for maintaining the patients and record of the patient details. This system not only reduces the manpower but also propose a priority to the patients who need emergency consultation with the doctor. Additionally, we have an online consultation option and booking an appointment with the doctor. By this scheme we need not go to the hospital thereby we can directly book an appointment and consult the doctor according to the patient's condition. The main purpose of the application is having online appointment with the doctor and consultation with the doctor could be made via online chat. This system would identify the patient's critical stage and accordingly would set the priority to consult the doctors. Electronic handover form with standardized and structured content provides us with a good mechanism to improve quality and safety at shift changes. CHFA can release lots of clinicians' time from documentation to care treatment and medical plan settings, since there are various contents in the handover form to be filled.

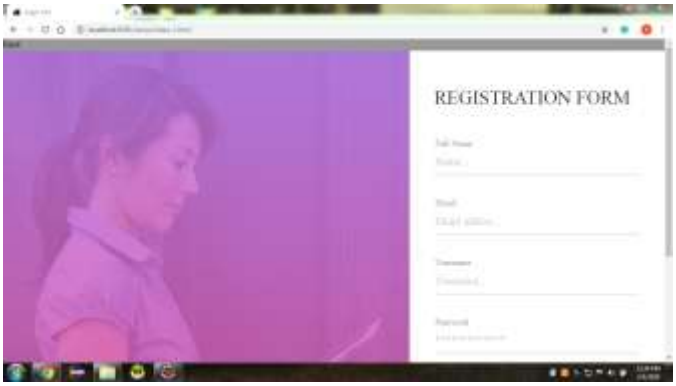
4. PROPOSED ARCHITECTURE

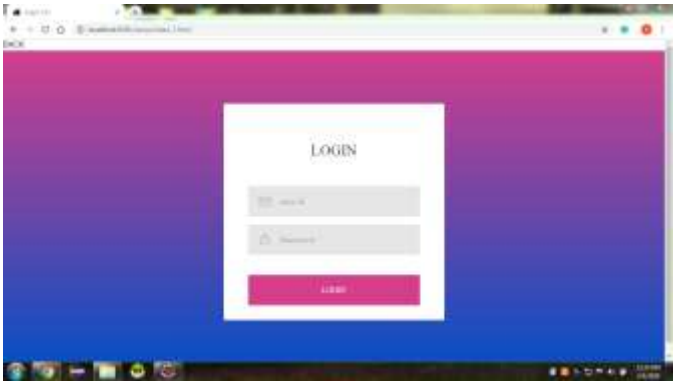


5. MODULES AND DESCRIPTION

5.1. ADMIN AND USER

In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as, user name, email, address and admin authorize the users. Large number of users will be accessing this platform. User should register before doing any operations. Once user registers, their details will be stored to the database. After completing the registration successfully, he/she has to login by using his/her own authorized username and password. Once Login is successful user will do some operations like view profile, add category, book appointment, to consult doctors and order medicine, to consult doctors via text message, and book the specialist.



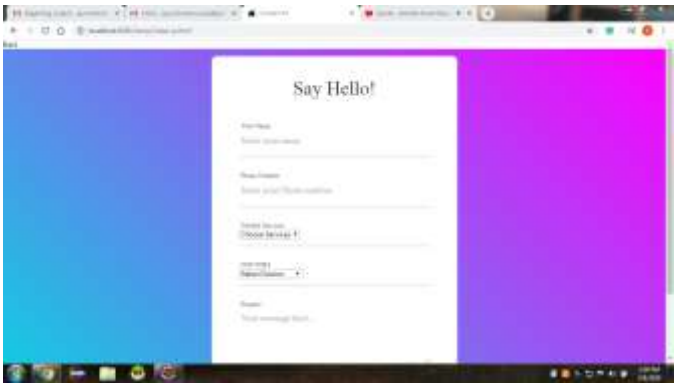


5.2. CONSULTANCY AND MAKE AN APPOINTMENT

The doctors in the hospitals will automatically carry out the procedures to give treatment to the patients in ill condition and will start taking steps to cure in terms of diagnosis. The work of the consultant goes beyond caring for patients. If you have an appointment with someone, you have arranged to see them at a time, usually in connection with their work or for a serious purpose.

5.3. ONLINE CONSULTANCY

An online doctor consultation is convenient and easy for those who live in remote areas and have busy schedules and those who are not in a situation to meet the doctor directly. By using a text conferencing platform in smartphone apps and online management systems, doctors can connect with patients through online and diagnose them in a kindly manner. A consultation is a professional advice to patient in order to diagnose their disease. online consultation has made it easy for both the doctors and patients nowadays in their busy schedule.



5.4. REGULAR CHECKUP AND OUTPATIENT TREATMENT

Regular health issues help in finding the early signs of a patient and helps in preventing it from the initial stage. Finding signs in the early stage can help you cure the disease in an effective and efficient manner. Many factors, like your age, health, case history and lifestyle choices, impact on how often you would like check-ups. An outpatient is someone who goes to a hospital for treatment but doesn't stay overnight. Hospital benefits include reimbursement for both inpatient and outpatient medical aid expenses. An outpatient is someone who goes ta hospital for treatment but does not stay overnight. Outpatient cover refers to diagnostic tests, consultations and procedures that don't require a single bed overnight. Things like biopsy, X-rays, MRI and CT scans are all samples of outpatient treatments. You can tweak your outpatient cover to form your plan more basic or comprehensive.

5.5. ORDERING MEDICINE THROUGH ONLINE

A medication order is written directions provided by a prescribing practitioner for a selected medication to be administered to a private. And we can consult the doctor in online treatment and ordered medicine which is suggest by doctors we purchase the tablets by use of these modules. These orders can be typed, handwritten, preprinted, verbal, or entered into the computer. Emergency orders or as-required orders are called as PRN orders, and these medications are given only needed. Signs and symptoms for the emergency orders includes coughing, sneezing, tiredness,

headache, earache, etc. In addition to it, it requires a PRN protocol to administer the medication.

6. CONCLUSION

Hereby we have created a project for the patients in government hospital to make an outpatient appointment, consult doctor through online, book appointments through online and we can get medicine from the specialized doctors. The project also analyses the health conditions of each patient and gives priority to those who needs to be treated first.

7. FUTURE ENHANCEMENT

In this paper we proposed only the patient who will able to come the hospitals, or normal people easy to use the application. Not only used for online consultation and also used for ordering the medicines for patients' purpose. This application is used for physically challenged people to consult the doctor in online also there is no need for creating crowd collision in government hospitals. In future there is possible to include the translation device for the other language people to utilize the auto filling methodology.

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