USING ARTIFICIAL INTELLIGENCE TO IMPROVE HOSPITAL INPATIENT CARE

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Abstract: The US healthcare system faces many challenges, including skyrocketing costs, high rates of drug-resistant and hospital-acquired infections, and failures of care delivery leading to preventable adverse health events. Over-treatment, poor execution of care, and failure to adopt best practices for preventive care and patient safety has huge and directly measurable impacts on both healthcare costs and patient outcomes. On the other hand, both the increasing availability of electronic health data and the ongoing development of methodological approaches to analyze these data suggest the potential for the use of artificial intelligence and machine learning methods to improve the quality and lower the cost of patient care. It enable significant application for patients to become primarily aware about their disorders and provide Doctors to have a viewing care on their patient even when they are out of sight from patient.

Keywords: Electronic Health Record, Clinical Decision Support System, Transaction Success Probability, and Distributed Denial of services

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1 Introduction

1.1 Overview:

Data mining is the process of analyzing data from different perspectives and summarizing into useful information. Data mining software is one of a number of analytical tools for analyzing data. The US healthcare system faces many challenges including high rates of drug-resistant and hospital acquired infections and failures of care delivering and poor execution of care and failure to adopt best practices for preventive care and safety performances. The biggest challenge for data mining is to truly impact the biomedical discovery process, enabling scientists to generate novel hypothesis to address the most crucial questions. Formulation of a flexible and general approach for integrating heterogeneous data and knowledge sources for discovery is elusive and highly dependent upon the specific underlying scientific question. The true impact of data mining is only realized if it goes beyond a focus on the methods for extraction and storage, and into the true impact they can have on enabling understanding of the molecular underpinnings of biological processes. In order to find the optimal way to integrate relevant information that will help translational and clinical researchers pinpoint novel findings, a thorough understanding of the decision process through which active researchers find the discoveries proposed by automated systems is required. However, very little is presently known about how scientists actually interpret this information. So that we have implemented the technique called Artificial intelligence to improve the quality and lower the cost of patient care. Inpatient care is the care of patients whose condition requires admission to a hospital. The ready use of medical technologies such as ventilators, defibrillators, dialysis, chemotherapy, surgery, and pharmaceuticals, allows people to survive disease-related events such as heart attacks, and prolongs the life of those suffering from incurable illness. Electronic health records (EHR) have become more available due to the guidelines of the Health Information Technology for Economic and Clinical Health (HITECH) Act, which offers incentives to healthcare providers to adopt EHR to advance clinical processes and improve outcomes. Another new approach that might improve patient care focuses on statistical machine learning methods for detecting anomalous patterns in massive quantities of healthcare data. We recently developed a variety of machine learning methods based on fast subset scanning to detect patterns in massive datasets, efficiently identifying subsets of data records.

The Figure Data-Driven and Knowledge-Driven Approach to Science illustrate a model for extracting the New Knowledge in Medical Technology in the Process of Data Mining. It Emphasis the various process undergoing in Mining the data’s and Explore the Significant Knowledge.
1.2 Problem Statement:

Data mining is relatively a new field of research whose major objective is to acquire knowledge from large amounts of data. A major impact is to evaluate data mining tools in medical and health care applications to develop a tool that can help make timely and accurate decisions. The goal of this review is to discuss the extent and role of the research area of predictive data mining and to propose a framework to cope with the problems of assessing and exploiting data mining models in clinical medicine. We recently developed a variety of machine learning methods based on fast subset scanning to detect patterns in massive datasets. In the patient care setting, our primary focus is to detect anomalous patterns of care that influence patient treatment and nonprofits such as the Health Care Cost Institute have committed to providing health insurance claims data with the goal of reducing costs while improving the quality and availability of coverage. Such sources provide detailed, time-stamped, and highly multivariate data for a large patient population, enabling the use of AI techniques to connect care practices and outcomes. In the Existing Technique Electronic Health Record leads to Complications such

- The data’s size and complexity and the variability in content and format between different providers, data types and care settings will create huge challenges.
- The potential danger of the violation of patient’s privacy has significant moral and legal ramifications, requiring extreme care in the use of health data due to this flowchart.

1.3 Objectives:

We analyze the problem of improving impatient health care system and providing antibiotic suggestion based on doctor’s report. Database design is the process of producing a detailed data model of a database. This logical data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a Data Definition Language, which can then be used to create a database.

- We are currently developing a system that will automatically detect substantial variations in care between groups that have significant impacts on patient outcomes.
- A second set of challenges is posed by the use of massive quantities of streaming data for real-time monitoring of patient health and safety.
- The effectiveness of sub-classification on the propensity score in removing bias, and balancing properties of propensity scores with incomplete data.

II Related Work

A. Solution And Mechanism:

The primary roles of AI in patient care to date have mainly been in patient diagnosis and image analysis, the future holds great potential for applying AI to improve many aspects of the patient care process. Some example include personalizing treatments to maximize efficacy while minimizing side effects, recommending appropriate sequences of diagnostic tests, monitoring the patient population’s health and safety, and discovering new medical knowledge that can directly impact the quality of care. Although these techniques enable accurate and efficient anomalous pattern detection in general datasets, several important challenges remain for their application to identifying anomalous patient care patterns. We wish to identify patient care patterns that are not just correlated with outcomes, but are likely to be causal factors influencing those outcomes. We are currently developing a system that will automatically detect substantial variations in care between groups that have significant impacts on patient outcomes. Challenge victory are also relevant to the healthcare domain, including its ability to incorporate huge volumes of unstructured text data (patients’ electronic health records, medical literature, and so on), respond to natural language queries, provide probabilistic reasoning to assist clinicians in making evidence-based decisions, and improve its performance through learning from user interaction.

**FIG: System Architecture**

The figure System Architecture illustrates the Data Flow between the patients, doctor, and admin. The patient gets the authentication and came to know about their disorders from web application through database. They can consult doctors through web application and doctors identify the patient disorders they answer the queries asking by patients. Finally the admin report about the patient queries and it will be hosted in the web application.
B. Methodologies And Algorithm:

We analyze the problem of improving impatient health care system and providing antibiotic suggestion based on doctor’s report. Sensitive analysis is conducted to concentrating on impatient health care and supporting artificial intelligence of queries based, report based antibiotic suggestion, by using ad-hoc algorithm. The methodologies include

GIVEN INPUT AND EXPECTED OUTPUT

AUTHENTICATION
Input: User identities such as Username, Password.
Output: Granting Access privilege

PATIENT MODULE
Input: Patient Profile Information’s such as contact number, address, etc.
Output: Granting Access privilege to the particular user.

DOCTOR MODULE
Input: Doctor Profile Information’s such as contact number, address, etc.
Output: Granting Access privilege to the particular user.

IN PATIENT CARE:
Input: User has to know the records.
Output: User Records will have been updated by doctors.

ADMIN MODULE
Input: Admin Profile Information’s such as contact number, address, etc.
Output: Granting Access privilege to the particular user.

APPOINTMENT SCHEDULING
Input: User has to request Appointment.
Output: Admin check and give appointment to patient.

Ad-Hoc Algorithm

Ad-Hoc Algorithm is a powerful yet insufficient algorithm for Markov decision process because it puts majority of the efforts backing up the entire state space, which turns out be unnecessary in many cases. In order to overcome this problem, many approaches have been proposed. These method use analysis and heuristic search to avoid some unnecessary backups.

STEP 1: Input: an MDP M the threshold value
STEP 2: initialize v arbitrarily
OUTPUT: Analysis Report.
INPUT: Patients
Electronic Health Record (EHR),
Electronic Medical Record (EMR)
Send Analysis Report
Submit EHR or EMR

Clinical Decision Support Tool
STEP 3: while true do
Bellman error
STEP 4: for each state s<s do
STEP 5: bellman residual(S)
STEP 6: if bellman_ error<s then
STEP 7: return v.

4. Simulation And Results

More recent advances in machine learning and AI build predictive models and make real-time inferences from a large patient population for purposes including alerts, stratifying risk and predicting the length of stay. Several of these approaches focus on critical care, using physiological data that are routinely recorded in intensive care units. In the proposed system AI along with clinical decision support system using Adhoc algorithm Provide a significant application to both the inpatient care units and the doctors.

The figure report generation in web application illustrates the inpatient care and the Doctors viewing the Patient disorders through web application. After the queries the particular patient record will be forwarded to the report generator. This web application gives the primary awareness to the patient to knew about their disorders to doctors through this web application.

The graph illustrates the doctor’s identification much easier through web application using Adhoc algorithm. The existing system provides increase efficiency in inpatient care application.

5. Conclusion And Future Enhancement

This paper produces new approach that might improve patient care focuses on statistical machine learning methods for detecting anomalous patterns in massive quantities of healthcare data. It can identify self-similar subsets of data...
records and combinations of attribute value which enable identifying patient care patterns. As part of our future work, the future holds great potential for applying AI to improve many aspects of the patient care process. Some example as a future enhancement, we planned to allocate the doctors for patient generated by application itself, include personalizing treatments to maximize efficiency while minimizing side effects, recommending appropriate sequences of diagnostic tests, monitoring the patient population’s health and safety, and discovering new medical knowledge that can directly impact the quality of Care and allocating with time schedule.

References: