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ML based Child Immunization System

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Prof. Supriya Kamble

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Internal Project

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- Machine learning algorithms
- SMS-Gateway and mailing system
- Django
- Health Prediction
- Web Application
- Children Vaccination
- Medical Treatment
- Reminder system

7 Problem Statement

Immunization is one of the most important ways by which parents can protect their child against serious diseases. Immunizations protect us from serious diseases and also prevent the spread of those diseases to others. And because of immunizations, we've seen the near eradication of others, such as polio and smallpox.

A delay in vaccination is not good for the health of a child. Children below the age of 5 have an under-developed immune system, especially those younger than age 1 year. According to statistics, approximately 80 million below the age of 1 year live in countries where routine immunisation services were disrupted, which put the residents at risk of developing vaccine-preventable diseases.

A sustained period of disrupted immunisation can result in an accumulation of susceptible individuals, which in turn can lead to disease outbreaks. Along with breast milk and a balanced diet, vaccine is the next important tool for the well-being of the baby.

Missing a vaccine puts your child at risk of contracting vaccine-preventable diseases. A delayed vaccination means making them susceptible to infections. The longer your child remains unimmunised, the higher their chances of getting exposed to and contracting diseases.

8 Abstract

Child Immunization is one of the core infrastructure elements in building smart cities, an initiative taken up by Indian government recently. India has the highest number of child mortality in the world due to inadequate healthcare, malnutrition and poor sanitation, all of which can be prevented. We develop the ml based child immunization system to address healthcare issue, where a common platform to store and retrieve complete child medical history information. It includes mandatory vaccination schedule details of child along with the previous medical history records and also use machine learning algorithm to predicts the child health and gives specific suggestions to improve child health Reminders to provide timely vaccinations to their child are also provided to alert parents to give their child health protection. Using Web and Mobile based technology, parents and doctors get access of the child's medical reports online anywhere, anytime with required privileges. This work helps both parents and doctors to provide better quality healthcare services. Finally, the collection of data can further be analysed to find the trends and pattern of diseases and this can pave a new beginning in the field of engineering and medical research for better and quality living.

SYNOPSIS

9 Goals and Objectives

- The Main Objectives of this system is to provide user friendly UI for schedule the vaccination and gives reminder to parents
- This system can define immunization, vaccination, immunity, antigen and antibody awareness.
- This system will helpful for storing the child data for future analysis of the child health.
- This system will increase the knowledge and skill among parents regarding immunization.
- This system can predict the health report as per the child data

10 Relevant mathematics associated with the Project

Algorithm

step 1 : start .

step 2 : Doctors can register on system.

step 3 : Parents register their child with their own mobile number.

step 4 : doctors, parents and nurses can be able to login into the system.

step 5 : Admin can manage the users and uploads all the blogs regarding.
Vaccinations.

step 6 : parents can gets appointment from the doctors by using the system.

step 7 : Then doctors accepts the appointment and schedule baby's vaccination.

step 8 : both doctors and parents can be able to track the vaccination report.

step 9 : System can be predicts the baby's health as per the data of vaccinations.

step 10 : system automatically send the SMS to their parents for remainder.

step 11 : User Logout.

11 Names of Conferences / Journals where papers can be published

- a. International Research Journal of Engineering and Technology (IRJET)
- b. IOSR Journal of Engineering (IOSRJEN)

12 Review of Conference/Journal Papers supporting Project idea

1 Dr. P.Hamsagayathri, Mr .S. Vigneshwaran,” Symptoms Based Disease Prediction Using Machine Learning Techniques”

Computer Aided Diagnosis (CAD) is quickly evolving, diverse field of study in medical analysis. Significant efforts have been made in recent years to develop computer-aided diagnostic applications, as failures in medical diagnosing processes can result in medical therapies that are severely deceptive. Therefore, pattern recognition essentially requires training from instances. In the bio medical area, pattern detection and ML promises to improve the reliability of disease approach and detection. They also respect the dispassion of the method of decisions making. ML provides a respectable approach to make superior and automated algorithm for the study of high dimension and multi - modal bio medicals data. The relative study of various ML algorithm for the detection of various disease such as heart disease, diabetes disease is given in this survey paper.

2 Shirin Hasan, Mir Mohammad Yousuf, Mubashir Farooq,” e-Vaccine: An Immunization App”

Due to lack of adequate healthcare, India has high Infant Mortality rates. Making sure that children have access to proper healthcare and immunization against diseases that can be prevented by vaccines, is a huge challenge that is being faced by developing countries like ours. This highlights the importance and need of having a better, smarter system in place, to improve the situations. In this paper, we developed to address this concern. This application provides a system to provide information, store records and help parents schedule vaccination appointments for their children.

3 Uzair Aslam Bhatti, Mengxing Huang, Hao Wang, "Recommendation System for Immunization Coverage and Monitoring"

Immunization averts an expected 2 to 3 million deaths every year from diphtheria, tetanus, pertussis (whooping cough), and measles; however, an additional 1.5 million deaths could be avoided if vaccination coverage was improved worldwide. In this paper, we have focused on data mining algorithms for big data using a collaborative approach for vaccination datasets to resolve problems with planning vaccinations in children, stocking vaccines, and tracking and monitoring non-vaccinated children appropriately. The overall performance of the model is good. The model has been implemented in hospitals to control vaccination across the coverage area.

4 Santoshi Kumari, Haripriya.A, Aruna.A, Vidya.D.S, Nithya.M.N, "Immunize - Baby Steps for smart healthcare"

Smart Healthcare is one of the core infrastructure elements in building smart cities, an initiative taken up by Indian government recently. This emphasizes the need for developing smart solutions to provide better quality healthcare services to all masses. As, India has the highest number of child mortality in the world due to inadequate healthcare, malnutrition and poor sanitation, all of which can be prevented. We present in this paper, a generic system to address healthcare issue, where a common platform to store and retrieve complete child medical history information. It includes mandatory vaccination schedule details of child along with the previous medical history records. Reminders to provide timely vaccinations to their child are also provided to alert parents to give their child health protection. This work helps both parents and doctors to provide better quality healthcare services.

5 Sneha Grampurohit ,Chetan Sagarnal “Disease Prediction using Machine Learning Algorithms ”

The accurate analysis of medical database benefits in early disease prediction, patient care and community services. The techniques of machine learning have been successfully employed in assorted applications including Disease prediction. The aim of developing classifier system using machine learning algorithms is to immensely help to solve the health-related issues by assisting the physicians to predict and diagnose diseases at an early stage. A Sample data of 4920 patients’ records diagnosed with 41 diseases was selected for analysis. A dependent variable was composed of 41 diseases. 95 of 132 independent variables(symptoms) closely related to diseases were selected and optimized. This research work carried out demonstrates the disease prediction system developed using Machine learning algorithms such as Decision Tree classifier, Random forest classifier, and Naïve Bayes classifier. The paper presents the comparative study of the results of the above algorithms used.

6 Assam Hamed Abbas, Yuhanis Yusof “Children Vaccination Reminder Via SMS Alert”

This study presents a model for children vaccination reminder using short message service (SMS). The model consists of data flow in reminding parents of their children vaccination schedule. Existing practice on vaccination schedule is via written appointment. Nevertheless, such approach may not be sufficient as parents may forget due to a tight work schedule and daily routines. The proposed model was evaluated by allowing selected respondents to use to the developed prototype. Results show that respondents do agree on the benefit of having reminder send via SMS. In addition, all of the respondents feel that the proposed system is useful.

7 Gloren S. Fuentes, Grace Lorraine D. Intal “E-healthcare: Child Monitoring Health System (CHMS) with SMS Functionality”

Children go through distinct stages of development as they move through from infants to young adults. These stages are as follows Infants/Babies whose age ranges from birth to two years of age, Toddlers/Pre-schoolers ranging from two to five years of age, School Age Children considers those who are of six to twelve years old and Adolescents/Teenagers who are of thirteen to eighteen years old. During these stages their health and safety are utmost important because these will influence their formative years. The study emphasizes the benefits of implementing a Child Health Monitoring System (CHMS) to a private hospital in order to provide a more efficient way of monitoring child's health. The researchers were able to determine the system requirements through survey and interviews with hospital key personnel as well as the parents. Design of the different modules were also presented.

8 Siti Nazazihah Rahmat, Arshad Jamal “Parental Reminder and Planner for Children Vaccination”

Nowadays, vaccination for kids has been a necessity for them and it is one of the responsibilities of parents to give all the vaccines for their appropriately on the right date as well. In order to that, the objective of this is project is to make an easier way of reminder for the parents to have an online vaccination planner website. Other than that, it also helps to keep record of the vaccinations which has been given earlier and it's easier to view the record anytime. As an outcome of the observation and survey, there are few difficulty takes place and the resolution can be done by developing this Parental Reminder and Planner for Children Vaccination. According to the observation, most of the users are keeping record of the vaccination given to their kids in a notebook or diary and they seems not to have any reminder for the upcoming vaccines.

9 Riyadi Purwanto , Andesita Prihantara Informatic “Design of Information System Immunized Care Services Based on Mobile “

Immunization in toddler expects each toddler to receive five types of basic immunization. Based on the results of research that has been carried out by the system testing, 64% of respondents stated strongly agree that with the existence of information systems, the management of the administration of toddler immunization can be more organized, the toddler immunization schedule is more controlled, the normal growth limit of toddlers can be known through E-KMS, consultation between mothers and doctors can be done online so that it can save time and money, mothers can monitor the track record of the growth of her toddler at any time by using a computer (web based) or using a smartphone (mobile based).

10 Akkem Yaganteeswarudu “Multi Disease Prediction Model by using Machine Learning and Flask API”

Many of the existing machine learning models for health care analysis are concentrating on one disease per analysis. To implement multiple disease analysis used machine learning algorithms, tensorflow and Flask API. Python pickling is used to save the model behaviour and python unpickling is used to load the pickle file whenever required. The importance of this article analysis in while analysing the diseases all the parameters which causes the disease is included so it possible to detect the maximum effects which the disease will cause. For example for diabetes analysis in many existing systems considered few parameters like age, sex, bmi, insulin, glucose, blood pressure, diabetes pedigree function, pregnancies, considered in addition to age, sex, bmi, insulin, glucose, blood pressure, diabetes pedigree function, pregnancies included serum creatinine, potassium, GlasgowComaScale, heart rate/pulse Rate, respiration rate, body temperature, low density lipoprotein (LDL), high density lipoprotein (HDL), TG (Triglycerides).

SYNOPSIS

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SYNOPSIS

13 Plan of Project Execution

Activity	Phase	Sept-Oct	Nov-Dec 2	Jan-Feb	March	Apr -May
	Phase- I	completed				
	Phase-II		completed			
			completed			
	Phase- III					
Conclusions						
Preparation of Project Report						