HEALTHCARE BOT USING MACHINE LEARNING

Rishabh Saxena[1], Supriyank Vishwakarma[2], Kumar Abhishek[3], Aishwary Dubey[4], J. Shiva Nandhini[5]

[1,2,3,4]Student, [5]Assistant Professor
Department of Computer Science and Engineering
SRM Institute of Science & Technology, Chennai, India

Abstract: **Mobile health care solutions involving patient monitoring are in increasing demand of today's healthcare industry. The use of multimodal inputs in a smart healthcare framework is promising due to the increase in accuracy of the systems involved in the framework. Machine Learning (ML) is the fastest rising arena in computer science, and health informatics is of extreme challenge. The aim of Machine Learning is to develop algorithms which can learn and progress over time and can be used for predictions. Machine Learning practices are widely used in various fields and primarily health care industry has been benefitted a lot through machine learning prediction techniques. Today there various alerting and risk management decision support tools available to monitor patient's healthcare quality. With the need to reduce healthcare costs and the movement towards personalized healthcare, the healthcare industry faces challenges in the essential areas like, electronic record management, data integration, and computer aided diagnoses and disease predictions which can be solved by using healthcare bots.**

Keywords: **Machine Learning, Healthcare, Model Predictions, Supervised & Unsupervised, Algorithm**

I. INTRODUCTION

Easy access to information is primary need today. People want a self-service option to make their interactions more engaging and personal. Patients have similar expectations from their healthcare providers. Smart healthcare is in great demand because of the increase in population and decrease in doctor-to-people ratio, and some people become are busy to travel to a specialized hospital for treatment. Continually rising costs, disparate systems of record and lack of patient engagement currently affect the industry which can be solved by digitization, multi-channel integration, and bots. Navigating menus and screens which have now became old and traditional are provided by the graphical user interfaces even today. It also provides speaking "computer language" rather than human language. But bots can be used to provide a two-way interaction based on text or voice input. They also learn and understand the conversation to meet a user's needs. The use of multimodal inputs in a smart healthcare framework is promising which leads to the increase in accuracy of the systems involved in the bot's framework. There are several parameters, such as ease of use of the medical sensors, low cost, high accuracy, ubiquitous nature of the framework, and less delay in making decision which are required by a successful smart healthcare bot. The bot should also support wide range of platforms so that it can be reached by larger percentage of population. This will help the bot in accessing the large amount of user's data for giving him or her a personalised experience. Machine Learning can be implemented for helping the bot to work on the huge amount of data and also to increase its efficiency.

II. RELATED WORK

Predictive Analytics is supporting different segments of health care life sciences and providers. It aims in diagnosing the diseases accurately, enhancement of patient care, resource optimization and also improves clinical outcomes. Predictive Analytics helps organizations to prepare for the health care by optimizing the cost. The accomplishment of predictive analytics in this industry is likely to provide proficient outcome by improving the service quality.

III. TECHNIQUES

Machine learning is an artificial intelligence application that helps a system to automatically learn about its user's data and develop computer programs to improve the overall experience.

A Machine Learning's Role in Predictions Enterprises are motivated to find greater meaning in the substantial amounts of data they generate and save every day. Machine learning methodologies are intended to find out the chance to optimize the decisions, based on the predictive value of large-scale data sets. It is evidencing to be effective at handling predictive tasks including defining which behaviours have the maximum tendency to drive preferred outcomes.
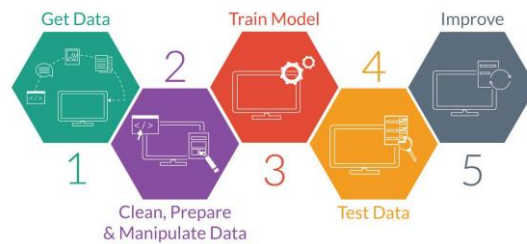
B.   Steps to implement machine learning to below steps.

1) Collecting data: Data is collected in electronic format which will help in formation of an algorithm to generate actionable information.

2) Exploring and preparing the data: The aim of machine learning is to collect quality data with the help of human intervention. It helps in learning the data which is called data exploration.

3) Training a model on the data: Data collected is further used to compose an algorithm.

4) Evaluating model performance: The algorithm formed is tested about its understanding of user's past experience which helps in improving its accuracy.

5) Improving model performance: Switching between different models and algorithm is done to use advanced strategies.

All the above steps should be properly implemented for a successful execution pf the model. The model may be applied to provide score data for predictions, for projections of financial data, to generate suitable insight for marketing or research, or to automate tasks. The next generation model uses the previous generation model to increase its efficiency and optimization

IV.   MACHINE LEARNING ALGORITHMS

An algorithm of machine learning learns from collected data and existing approaches. It is of two types: supervised learners and unsupervised learners.

A. The Supervised Learning: A value is predicted from existing values in database. This model is given instruction to learn and get trained from the data available. This machine learning type is used to build a model that recognizes existing data and generate new predictions and algorithm.

B. Unsupervised Learning: Existing transactional data is studied and the model summarises the database. In this learning technique there is not any aim to learn, but to discern the data and get few structures within.
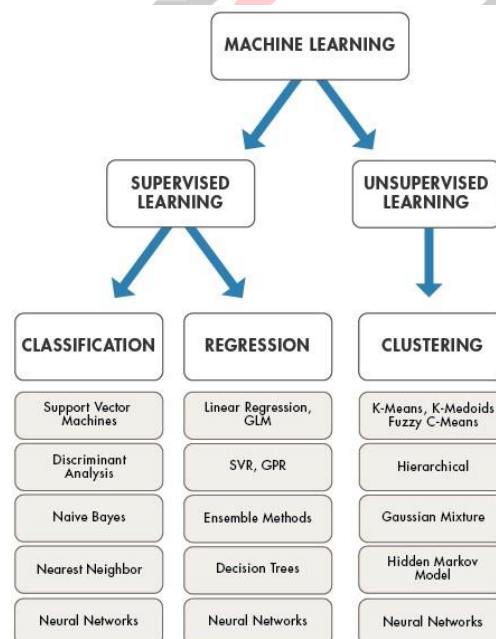
C. Semi Supervised Learning: This technique is similar to supervised learning and uses both labelled and unlabeled data for training. Semi supervised learning is used by methods such as classification, regression and prediction to keep the cost associated with labelling low.

Types of Machine Learning – At a Glance
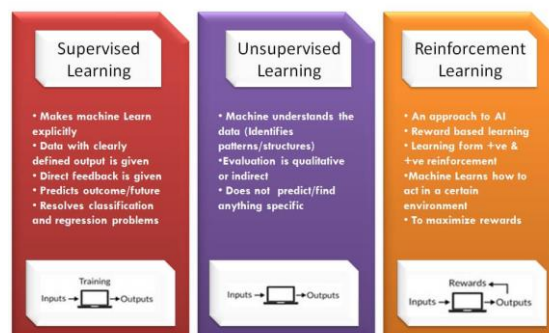
D. Reinforcement Learning (RL): In this type of learning, the model takes decisions maximize the efficiency. There is very less human intervention in this type of learning technique and algorithm gets developed through trial and error.

V.   MACHINE LEARNING IN HEALTH CARE PREDICTIONS

Machine learning algorithms are always effective in discerning complex patterns in gigantic data. This adequacy is well suited through medical applications, especially those that depends on convoluted proteomic & genomic magnitude. Therefore, machine learning is habitually in numerous disease diagnosis and unearthing. In medical applications machine learning algorithms can cater better decisions regarding treatment plans for patients by means of providing serviceable healthcare system. Machine learning performs a vital functionality in many radiological applications. It also distinguishes complex patterns automatically and helps radiologists make intelligent judgement on radiological data such as conventional radiographs, Computed tomography, Magnetic Resonance Imaging, and PET images & radiology reports. Observational analysis has proven that various types of disease predictions can be carried out using different types of machine learning prediction techniques. In recent times diagnosis & prediction will be possible on various diseases which may include the likes of Cardiovascular diseases, cancers, Diabetes, Hepatitis Asthma, Tuberculosis (TB) and Blood Pressure Monitoring, these will be carried out using various machine learning predictions techniques. Some of the glimpses provided on prediction of models applied in major diseases through the exercitation of machine learning are discussed here.

A.   Predictions on Cardio vascular Diseases upset (CVD) is thought as a class of diseases that conclude the centre or the blood vessels. upset includes arteria coronary diseases (CAD) referred to as angina and conjointly infarction (heart attack), stroke, hypertensive cardiopathy, rheumatic, heart disease, arrhythmia, inherent cardiopathy, carditis, arterial blood vessel aneurysms, peripheral artery illness. designation furthermore as prediction of heart diseases is primarily essential because it is that the leading causes of fatality everywhere the planet. mammoth works on prediction of heart diseases area unit found out in health care analysis & development. the foremost effective tools, neural networks & genetic algorithms displayed a method for prediction of cardiopathy mistreatment major deciding factors like age, case history, diabetes, high blood pressure, cholesterol, smoking, alcohol intake, fatness or the other physical inactivity.

Example: heart disease risk prediction

The strategy is named Naive Bayes, Neural network furthermore as call tree algorithms area unit used on analysis of medical information assortment with approach for cardiopathy prediction. A demo example referred to as Intelligent cardiopathy Prediction System (IHDPS) has been created with the assistance of those call Trees, Naive Bayes furthermore as Neural Network. Results exhibited that every of those techniques have their distinctive strengths in realizing the target of the outlined mining targets.

B.   Diabetes Predictions for mellitus could be a chronic illness and conjointly a serious public health challenge face by the planet. It acts once their square measure high glucose levels diagnosed over a chronic amount of your time. Lately, it's been outlined as a risk issue used conjointly for developing Alzheimer that could be a leading cause for visual impairment. several techniques that have already been discovered to derive the explanations of polygenic disease & cure it. a number of the predictions on polygenic disease is explicit here. The analysis on polygenic disease prediction mentioned concerning establishing a relationship between polygenic disease risk probably to be developed from a human daily life-style activity like his/her uptake habits, sleeping habits, physical activity beside different indicators like BMI (Body Mass Index), waist circumference. A Chi-Squared take a look at of

Independence was performed followed by application of the CART (Classification and Regression Trees) machine learning algorithmic program on the info.
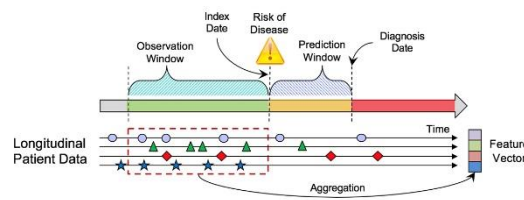
The analysis concerning the performance of the Naïve mathematician classifier, RBF network and SVM Classifier within the heart, cancer and polygenic disease datasets shows that SVM classifier produces higher share of accuracy in classification. The work has been dead in wood hen surroundings and earned results show that SVM is that the most sturdy and effective classifier for medical knowledge sets.
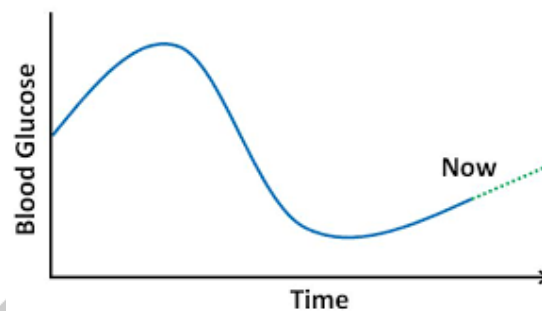
C.   Hepatitis malady Prediction liver disease means that Associate in Nursing injury to the liver with inflammation of the liver cells. The malady may be self-limiting or will get to pathology, cirrhosis of the liver or cancer of the liver. liver disease viruses are the foremost common supply of liver disease within the world however alternative infections and unhealthful substances may also cause liver disease.
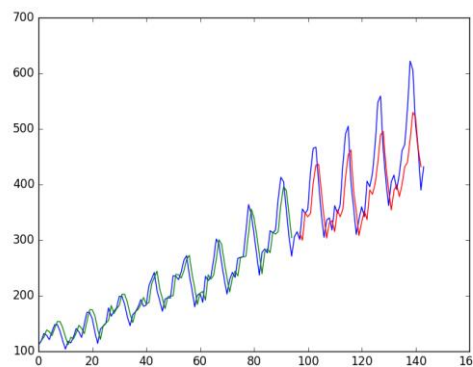

There are 5 core liver disease viruses, explicit to as varieties A, B, C, D and E. identification of {hepatitis infectious malady liver disease} disease is conducted with a machine learning technique planned a unique machine learning technique that hybridizes support vector machine (SVM) and Simulated hardening (SA). Simulated hardening may be a random technique presently in wide use for optimisation. There was attention on the facet of diagnosis by learning pattern through the collected information of liver disease and to develop intelligent medical call support systems to assist the physicians [30]. This work anticipated the employment of call trees C4.5 formula, ID3 formula and CART formula to categorise the diseases. Few studies planned the ways in which to get correct prediction results and a lot of informative information concerning the viral hepatitis Virus (HCV) macromolecule sites mistreatment call tree formula.

D.   Cancer Predictions Using Machine Learning Cancer is the universal name for a group of more than 100 diseases. The development initiates with viral production of cells resulting in self-harmful cancerous cell. The cancer cell varies with the cell origination and hence there are various type of cancers. A continuous evolutional research related to cancer research has occurred concerning the prediction of cancers like lung, skin, liver and stomach. The prediction and result calculations are done through techniques like data mining and machine learning.

In recent years of research, a few optimized models on breast cancer diagnosis and recurrence prediction were developed by using various risk prediction algorithms and techniques. There are reviews about various researches made to predict cancer prognosis across cancer types and subtypes. This review suggests to validate a method across multiple sets of patients and conclusion

is to understand which data sets are most informative for a particular variety. The survival rate of a patient can be calculated through techniques of data mining and machine learning. These techniques can also help in controlling the relapse of cancer.
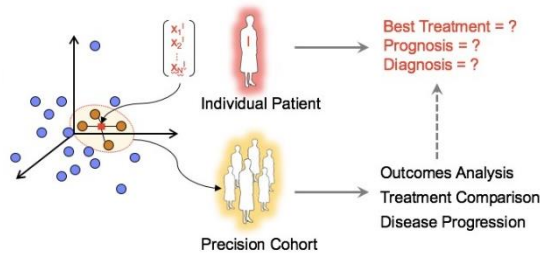
An alternative study of machine learning models was carried out for the survival rate expectancy and Artificial Intelligence considering the algorithms to cater it. Artificial Neural Network (ANN) have been used to develop the predictive models for recurrence prediction for cancer. The idea behind this was to evaluate the efficiency of these three algorithms on the data through approach, perfection, and precision. To diagnose recurrence in cervical cancer, probabilistic model method has been used. In cervical cancer recurrence prediction research, MARS and C5.0 classifier techniques were used, and the results showed that decision tree model is better than MARS. In recent times diagnosis and prediction on further diseases like Asthma, Tuberculosis (TB) and Blood Pressure Monitoring have been carried out using various data mining and machine learning techniques.

VI. CONCLUSION

In the fast-growing industry of technology in the sector of healthcare, there is a requirement to have a proper healthcare management system which being accurate with the analysis should also be handheld so that it can be carried as a personalized health care system. The healthcare bot will be based on machine learning concepts. The aim of Machine Learning is to develop algorithms which can learn and progress over time and can be used for predictions. It will provide with better analysis and consideration for the disease and can provide with vital data regarding the cure and processes. It will also help doctors to provide better treatment for the illness and will reduce the fatality rate.
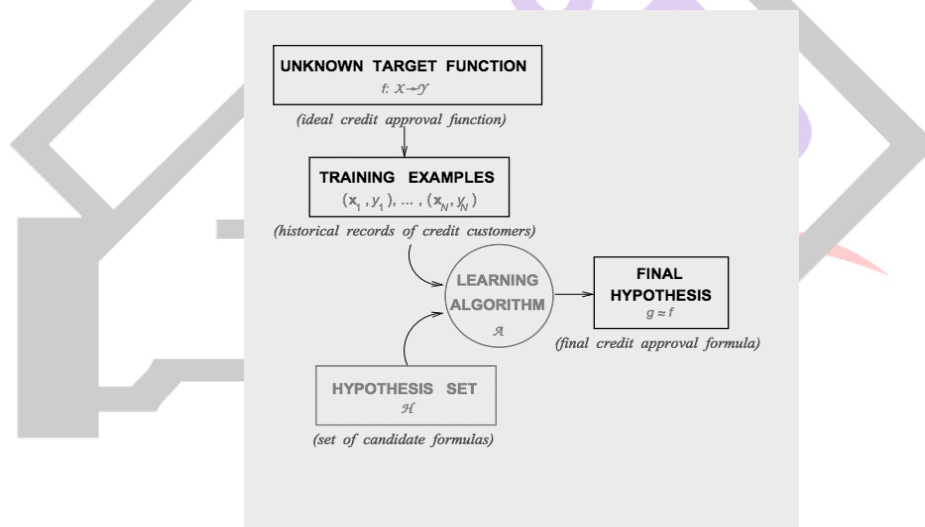
VII. FUTURE ENHANCEMENT

The healthcare bot will be optimized further in future to support various kinds of devices running on different platforms. More number of task-force and health related service providers will be linked with the healthcare. Further the healthcare bot will also have website of its own which will be online 24/7 throughout the week.

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