Mobile Based Healthcare Tool an Integrated Disease Prediction & Recommendation System

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ABSTRACT

Recent advances in mobile technology and machine learning together steer us to create a mobile-based healthcare app for recommending disease. In this study, the authors develop an android-based healthcare app which will detect all kinds of diseases in no time. The authors developed a novel, hybrid machine-learning algorithm in order to provide more accurate results. For the same purpose, the authors have combined two machine-learning algorithms, SVM and GA. The proposed algorithms will enhance the accuracy and at the same time reduce the complexity and count of attributes in the database. Analysis of algorithm is also done using statistical parameters like accuracy, confusion matrix, and roc-curve. The pivotal intent of this research work is to create an android-based healthcare app which will predict disease when provided with certain details. For a disease like cancer, for which a series of tests are required for confirmation, this app will quickly detect cancer and it is helpful to doctors as they can start the right course of treatment right away. Further, this app will also recommend a diet fitting the patient profile.

KEYWORDS

Android-Based Mobile Technology, Diet Recommendation, GA, Healthcare Management, Hybrid Approach, Real-time Disease Prediction, SVM

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1. INTRODUCTION

With the heavy use of mobile technologies these days researchers are gaining attention to develop mobile based tools with the ensemble of machine learning techniques to make that system more intelligent. The cheap price and a user-friendly interface make the Android OS useful to develop mobile-based tools for healthcare sector. It provides the new advanced possibilities of monitoring patient health and diagnosing disease within no time. Just input certain attributes and disease outcome is in front of you which in turn reduce the mortality rate due to late diagnosis of disease.

The usage of smartphones has added many advantages to healthcare professionals and improves the overall healthcare system and leads to effective decision making. With the lack of time and high cost of consultation and medical tests demand for automated disease detection tool which makes traditional diagnosis system obsolete. E-healthcare systems are basically targeted for old age people, poor people those who can’t afford the heavy medical expense, and for those who do have busy lifestyle. E-healthcare systems are of low cost and because of massive mobile users found in every home (Sundararajan et al., 2014). Till date we think that main application of mobile phones is to connect with other person though calling or text messages but now with the innovation of smart phones mobile phone is used in the domains like, transportation, food, social network, and healthcare, etc.

Smart phones provide facility to attach innovative application to mobile phones that reserve time and cost. With the development of advanced healthcare applications, we can save patient time that goes wasted in appointment with doctor, consultation time, and time wasted in medical tests that are essential for disease diagnosis. These advanced Applications will facilitate rapid diagnosis with in no time, user need to input certain values like age, gender, body mass index (BMI), etc. and result is in front of them. Expert doctors are not available in rural areas so in rural areas disease is not diagnosed at right time and if the disease is life threatening it can further result in death of person due to late diagnosis. But if a mobile based healthcare application is present it can detect disease, and right course of treatment will start immediately which in turn helps improving the quality of healthcare services. Nowadays, mobile phones started to integrate the feature of e-health services (Han et al., 2011) and with the integration of e-healthcare services in mobile phones it will seek to achieve the following objectives (Rahar, 2013): Enhance Healthcare efficiency, reducing maternal mortality rate, Enhanced quality for maternity related issues, and improved efficiency for remote consultation and diagnosis system.

Main grail of the presented research work is to create a mobile based e-healthcare tool to improve the quality and decision making in healthcare sector. For disease diagnosis on mobile interface, patient health condition and symptoms must be analyzed for providing accurate diagnosis. Moreover, the proposed tool is independent of disease type and it can detect any disease with higher accuracy. We have combined Support vector machine (SVM) with a genetic algorithm (GA) to create an ensemble
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