


Chapter 9

Disease Diagnosis Interface Using Machine Learning Technique

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ABSTRACT

Self-care has acquired relevance, especially in light of the COVID-19 scenario. For anyone to diagnose underlying disorders without a doctor's involvement, improved remote healthcare equipment was required. Due to recent technical breakthroughs, this mission is no longer insurmountable. The objective is to develop an interactive application that can identify potential reasons for a person's discomfort. The primary objective is to carry out a trustworthy machine learning technique that can accurately predict a person's status depending on their symptoms. The collection includes 5000 individual cases and 133 distinctive symptom types. On the same dataset, three alternative models (support vector classification, random forest and Naive Bayes) were instructed to achieve maximum accuracy. The second part involves developing a web application and integrating the model with it. The primary aim of the project is to implement a machine learning based web application that is user-friendly and easy to understand, so that patients can detect their problems before visiting a doctor.

DOI: 10.4018/978-1-6684-8306-0.ch009

INTRODUCTION

Online Disease Diagnosis (ODD) are smart medical tools that are frequently used in health care. ODD uses techniques like machine learning (ML) to enable self-disease identification through symptoms reported by medical persons. The fast advancement of the digital community and the medical industry has increased the demand for symptom checkers (SC) in the application (app) market. Tens of millions of people have downloaded the Symptom Checkers (SC) apps from app shops, including Apollo. These SCs collect user-submitted symptoms and provide users with a provisional diagnosis via a chatbot or a form that mimics a questionnaire. Some SCs equate themselves to knowledgeable medical professionals who offer reliable and accurate information. However, particularly in high-stakes industries like healthcare, the lack of transparency and understandability in intelligent systems may have unintended consequences like misleading consumers. Consumers of healthcare risk their health if they blindly accept the SCs' diagnosis.

The economy and the welfare of humanity depend on a functional healthcare system. There are a lot of changes between the current scenario and the one we did a few decades ago. Everything has become more disorganised and uglier. In this case, medical professionals are risking their own lives in order to save as many lives as they possibly can. Approved doctors can do online consultation instead of offline consultations when they can. However this is not always possible in an emergency. In this situation pre-trained machines can do disease diagnosis.

Without involving a person, a disease predictor, also referred to as a virtual doctor, can correctly forecast a patient's illness. In severe cases, like COVID-19 and EBOLA, ODD can help patients to identify their health without the need for physical contact.

According to estimates, more than 70% of Indians are susceptible to common illnesses including the flu, cold, and other viral infections every two months. 25% of the population passes away as a result of disregarding the early general body symptoms because many individuals are unaware that these illnesses could be indicators of something more dangerous. This situation has the potential to be worrisome and harmful for the populace. It is hard to detect or identify the illness in the early stages to prevent the worst condition. The systems that are currently in use are either those that are focused on a specific ailment or are in the research stage for algorithms when it comes to generalised disease.

When something goes wrong inside of us, our bodies will exhibit symptoms. Sometimes these symptoms will indicate a little issue, but other times they may indicate a serious illness. If the symptoms are not analysed it will lead to the worst disease. So, the ODD is helped to identify the worst disease by analysing the symptoms in order to treat them at an early stage. It reduces the time and complexity to analyse the symptoms to get diagnosis and recommendations in the early stages itself. So, the patients can diagnose the necessary disorders.

The Proposed ODD has a Dialog Box which asks the user to enter the symptoms faced by them. They can select from a drop-down list that consists of all the major symptoms. Once Done entering the Symptoms the user can then view the diagnosis results of the given symptoms which would suggest the kind of Disease and it's severity based on the symptoms given.

The accuracy of the symptom checkers (SC) model and the symptom checkers (SC) app's usability by users of all ages are highlighted in this chapter. The study of the literature reveals the most precise ML models that can be applied to the problem. To attain very low error possibilities in this project, 3 of these high accuracy producing models have been implemented simultaneously.

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