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RESEARCH ARTICLE

SMART EYE EXAMINATION ROOM WITH INTERNET OF THINGS AND MACHINE LEARNING ALGORITHM

***Hari Haran, B.**

Final Year Student, Department of Computer Science and Engineering, Panimalar Engineering College, Chennai, India

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ABSTRACT

Nearly 38 percent of the individual are facing the eye power issues like long sight and short sight. Comparing to the Gene and all the day to day activities due to oner usage of the mobile phone, tablets, television and video games the eye power can be increased. There are different parameters where individual feel that the power is increased by improper vision. So individual will visit near by ophthalmologist (Eye physician) .And meeting an eye physician is not an easy way where all requires prior appointment to meet him. So the main objective of the research is to check the eye power without any eye physician or eye examiner. This can be done with few sensors and Machine learning algorithm.

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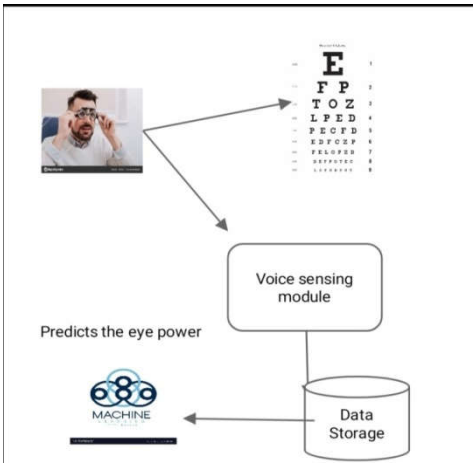
INTRODUCTION

Replacing the manual work with the Internet of things is the recent trends. By using the some of the sensors which used to detect the voice and by filtering the noisy data using the Digital Signal Processing (Data Cleaning), we can create a model to predict the accuracy level of the human eye power. The major role played here is Internet of Things because the communication between the sensors and final output database is the phase one and next phase is to get the data and we can predict the power of each patient.

Traditional Method: Firstly the eye power can be checked manually by optometrist by using the Snellen chart which has the numbers and letters in different sizes and the individual is allowed to read the letters and number with different types of lens with the answer provided by the individual optometrist will prescribe the lens to them. This method is really good method where there are huge time is consumed and optometrist should be available all time to start the process. Even the process is so simple in evaluating the words and letters said by the individual. It is examined by optometrist. As stated earlier it may cause the time delay if more individuals are waiting and only one optometrist can do this examination.

****Corresponding author:*** **Hari Haran, B.,**
Final Year Student, Department of Computer Science and Engineering, Panimalar Engineering College, Chennai, India.

Smart Eye Examination Room: The Smart Examination Eye Room will sense the power of the individual. It has few modules in it.



Voice Module: The Voice Module has the sensor which used to get the voice from the individual and check with the Snellan chart words or numbers and this matches with it by the arduino programming.

Data Engine: The collected data from the sensor is collected and stored in the data engine.

The Collected data has to be processed using signal cleaning and data filtering because it has many unwanted data. The data cleaning can be made by digital signal processing methods. The processing may include different cleaning algorithm such as Moving window algorithm by using k value as the window size.

Machine Learning Algorithm for Prediction: The collected data from the sensor once the data cleaning process is done. It is loaded in to the machine learning algorithm which predicts the human eye power. The algorithm can be data clustering. In Data Cleaning algorithm we can use the most popular one called as k-means algorithm. By using the k - means algorithm the eye power prediction can be made.

K- means Algorithm: The data can be classified in to some different classes according to the sensor value. Based on the voice sensing module the output can be either 1 or 0 where 1 is the right path and 0 is the negative path. To be in the clear explanation 1 has the data set of correct prediction of the individual based on the lens he wear and 0 has the data set of incorrect prediction of the user based on the lens he wear. Corresponding to the lens value (0.5,+0.75) the 0 s and 1s are arranged in the csv file after the data cleaning process. Then the k means algorithm is generated and based on the k means algorithm predicted value of the individual eye power is predicted.

The majority of the values ploted using the matplot lib are classified in to the separate group using the k means classification. So the huge population can be predicted in the meta heuristic based optimization technique and power is predicted in the similar way.

Conclusion

Since this is the research proposal article the future work will have the results and observation. Setting up the laboratory by using the sensors and the Snellen chart is the major part of the research project. The Data collection and the Data cleaning does not require any patient activity. It only requires the old data values.

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