A MACHINE LEARNING BASED HEALTH ASSISTANT SYSTEM FOR DISABLED

[1]Dr.E.S.Shamila, [2]Umapathi K,[3]Riyan Z,[4]Riyas Khan M S,[5]Saravanakumar V

[1]Professor, [2,3,4,5]UG Final Year Students,

[1,2,3,4,5]Department of Computer Science and Engineering,

[1,2,3,4,5]Jansons Institute of Technology, Karumathampatti, Coimbatore,India

Abstract - Voice-controlled systems have recently gained popularity with the release of commercial products, including Amazon Alexa and Google Assistant. Voice-controlled system have many potential use cases in healthcare, including education, health tracking and monitoring, and assistance with locating health providers. But, there is a need for conversational AI that can predict the user's need and guide them. Here we propose a system that works on voice controlled user interface powered by artificial intelligence. Thus, this work aims to develop an application on mobile devices that is able to allow users to get instant guidance on their health issues through an intelligent health care system This system also integrated with machine learning models to recommend the perfect exercise plan and also has food classification model to recommend what to eat for which body type and also recommend recipes .The system also has e-health care facilities where the user will get cure and get health specialist advice on real-time

Index Terms – Voice UI, Food Classifier, NLP, TTS

I. INTRODUCTION

During pandemic, people need to keep themselves fit and need to improve immune system. In quarantine, people often lead an unhealthy lifestyle by eating junk food and not exercising properly. Our ideal app for those who want to maintain a track of their meals, this application help users keep updated about their weight gain and loss. This app is for those who are looking for a healthier lifestyle during global pandemic, since it provides updated news regarding health and gives dietary recommendation.

The proposed Application allows the end user with losing weight and to guide them to healthier lifestyle by showing health news about food habits etc. The user can get a nutrition content based on the kind of foods they entered as input. This application can be very helpful to those who are cautious about what they are eating in each meal. It helps users create a daily calorie goal and consume food only according to dietary preferences. Our application also shows number of calories each of the recipes contain. This application will save your entire data regarding your diet and offer the user with assistance in consuming healthy food timely.

Having a smartphone with several tools or applications that help in tracking their diet and nutrition habits every day. Keeping track of your dietary intake and physical activity is difficult. Since, we cannot effectively browse through internet about what is good for our health. So, we made the single source which provides all the necessary tools for the user's need and also our application cross-platform application.

II. STATE OF ART

The research has also been done that would help the people with disabilities by Personal Health Assistant on Android Mobile Device: Sleeping, Nutrition and Exercise. The studies show good health can be achieved by maintaining good behaviours such as a good night sleep,E nough exercise and good nutrition. However, the competitive environment nowadays prevents suchgood behaviours. Thus, this work aims to develop an application on mobile devices that is able to record the daily sleeping, exercise and nutrition information, analyse the collected informationin order to provide a notification or an alarm, and present the analysed results in a simple andeasy to understand format.

The proposed application can collect data from other application andFrom the users. A set of simple data analysis methods is performed on the collected data in order toprovide a personal health advice based on the user pre-defined preferences.

Better health can be achieved by maintaining a simple lifestyle such as a good night sleep, enough exercises and good nutrition. People spend one third of their lives sleeping

however most people do not understand the importance of sleep. Moreover, the lack of sleep can affect a person's memory and emotion. The exercise habit and nutrition can also lead to good health. Daily working life can be affected by lack of sleep such as drowsiness and long-term health problems [1,2].

Many researches have shown that not enough sleep or exercise can lead to many health problems such as GERD [3], Alzheimer's disease [4], hearth disease [5], sleep apnea [6] and insomnia [7].

In the competitive work environment, nowadays, it is not easy for many people to manage good sleeping and exercise habits. With busy work and personal life schedules, many people indulge themselves in a bad sleeping habit such as sleeping very late or waking up very late especially in young adults and teeenagers. A good night sleep can also be affected by the person's exercise habits and nutrition consumption. The sleep, nutrition and exercise have more complicated relationship than many people have realized [8].

Enough exercise helps people sleep better and good nutrition also lead to better mood and better health. Thus, a that can automatically record personal information, produce a warning, and give personal advices to its owner in order to maintain good sleeping, exercise and nutrition habits is needed.

Today smart phone technology is a good candidate for this project because of its low cost, portability and capability which is similar or close to a personal computer. Moreover, a phone has become a typical device in daily activity. In addition, a current smart phone includes a lot of sensors such as an accelerometer, a microphone and a light sensor. These features make a smart phone suitable for collecting personal data in this work.

Android is a Linux-based operating designed for touch screen mobile devices. Lately, Android becomes the world's most widely used smart phone platform [9]. Especially, its customizable features allow Androids to be the software of choice for many developers.

Even though they covered these things, they did not cover about how the disabled people access the system.

III. EXISTING SYSTEM OVERVIEW

Inputs are fetched from user by using regular input fields. User have to navigate between screens by touch and disabled people can't access the contents by their own The System needs active internet connection, the data may inaccurate If there is a problem with internet The developers are also needed to build for different platforms, for example we need to develop each system for android, iOS and web-application separately

IV. PROPOSED SYSTEM

AI based voice controlled user interface for our health application which provides all the necessary tools for the user's need and also our application cross-platform application. The System contains a machine learning based

food classifier. Our system recommends exercise plan based on user data. Our system has e- health care feature that the user can get the health specialist in no time .

Learning (ML), Speech-to-Text (STT) and Text-to-Speech (TTS) used in the system.
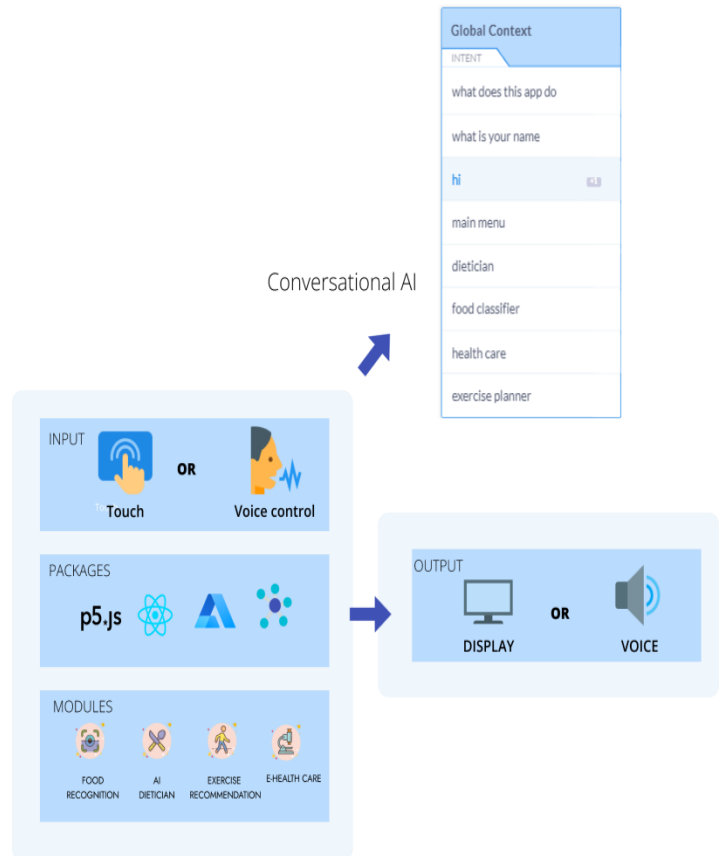

Figure 1. Architecture of Proposed System

The system consists of four modules namely AI dietician, E-health care , meal recommendation and food classifier where the all of these modules are navigated and controlled using conversational AI voice assistant and the ML models for food classifier and exercise recommender is integrated at backend.The system implements conversational AI to get information from user.
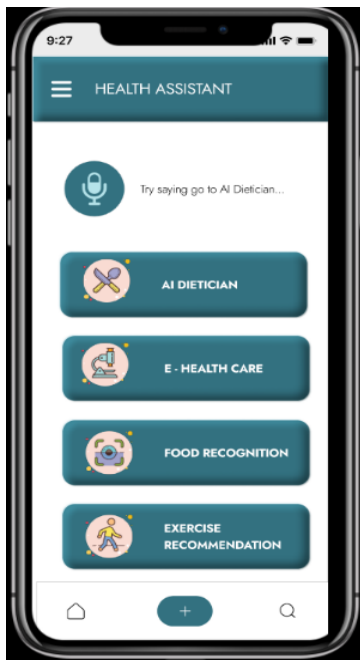
Figure 2.Main Menu

Main Menu

The main module of the system is home screen where all other modules were navigated through home screen. In the above shown architecture diagram there are five modules are provided which user can interact using the user interface and through voice assistant.

To implement Voice controlled UI we used Alan AI SDK
The main voice technologies used by Alan are:
1. Natural language processing (NLP)
2. Spoken Language Understanding (SLU)
3. Automatic Speech Recognition (ASR)
4. Machine Learning (ML)
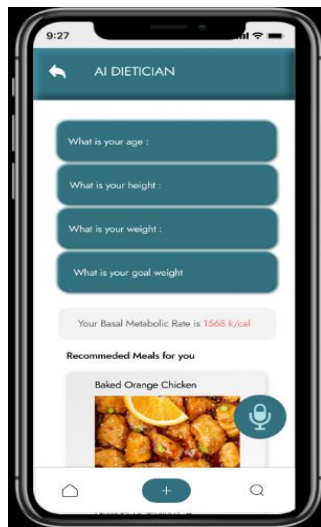5. Speech-to-Text (STT) and Text-to-Speech (TTS)

Figure 3.AI Dietician

The following modules used for implementation:

AI Dietician

In this module based on the user's Basal metabolic rate and weight gain or weight loss plan BMR is provided
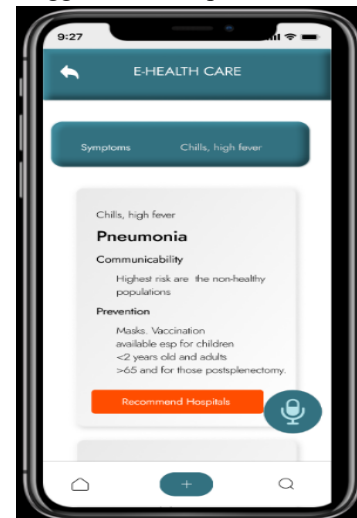Then the System suggest the meal planner for the user

Figure 4. E-Health Care

E-Health Care

In this module the symptoms provided by the user, the system can suggest the several diseases. It shows the diseases and the hospital recommendations, and also provides the prevention strategies. It provides the food which is better for that situation.

Figure 5. Food classifier

Food classifier

This module is used by user to know the name and calories content of the food.The Food can be either uploaded to the system to identify or food can be shown in the camera to predict the name of the food.For this model various Indian food images are collected and trained with teachable machine learning. Then ML-Model is integrated with the help of p5.js and react
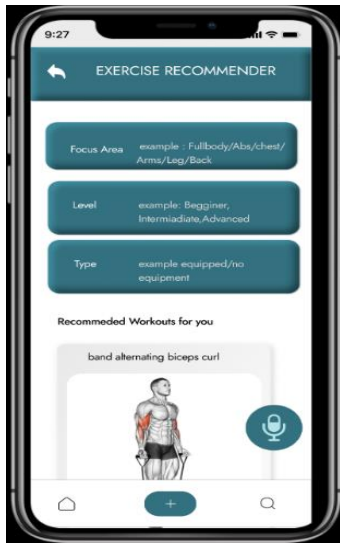
Figure 6. Exercise Recommendation

Exercise Recommendation

This is the module where user can get there exercise recommendation .by getting there focus area, level and type of workout and the exercise recommendation model will give the optimal exercise for the user

VI. Conclusion

In this work, our health assistant is cross-platform mobile application is designed and developed using react-native for frontend and for the backend we used node server. We used teachable machine learning models for food classifier and exercise recommendation and successfully integrated the ML model into the application. To make the application Interactive, we build AI based voice controlled and conversational AI to navigate and command between screens

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