"Review on: Virtual Assistant and Patient Monitoring System by using AI & Data Science"

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Abstract: - Technologies like Artificial intelligence, machine learning, data science are getting upgraded. The advancement in available, portable, low cost handheld device like cell phones and availability of network connection has resulted in the user's mobility at an unprecedented level. We have studied different methodologies like Smart goal annotation, state phase annotation, collection process, agreement results as well as annotation skills for achieving the health goals. The user has to type their health regarding query based on that assistant gives the appropriate answer. The facilities like report generation as well as scheduling assignment are provided. It will increase the interaction between humans and machines with the help of different technologies, vast dialogue ,conversational knowledge based, general knowledge based. The system using different algorithms for disease recognition, behavior abnormality detection, prediction etc. Experimental result shows that: Compared with traditional methods, the proposed method is more accurate and faster also patient can get service anywhere and anytime.

Keywords-: Artificial intelligence(AI), Data Science, Machine Learning; Naive Bayes algorithm for behavior recognition, Hidden Markov Model for abnormality detection, data mining techniques for prediction.

Introduction:

Among the massive applications enabled by the AI ,data science and machine learning smart ,fast and secure virtual patient monitoring system is important one. The diagnosis and analysis of patients include several physiological parameters like Electrocardiogram (ECG),blood pressure, sugar rate, pulse rate etc.[1]
	Health coaching is an established process for improving poor health behaviors by providing education on health related topics .Automated coaching system has been developed with the aim of improving health coaching accessibility for millions of people could benefit from them.[2]while the supply of well trained psychologist is not sufficient in the market A recent study shows the psychologist supply is projected to decline by 900.[3]A virtual medical instrument is adding a set of software and hardware on the general-purpose computer, while user operates this computer as if operating a special traditional medicine equipment. Given the adequacy space to exert ability and imagination, user can design own medicine instrument system to satisfy various application demand. Artificial Intelligence and data science are technologies used for the virtual assistant it uses various data mining algorithms the huge information related to disease has been collected, various behavior recognition algorithm helps to predict the result. The all data is collected with the help of server.

Literature Review:

[1] Itika Gupta, Brian Ziebart, Bing Liu "Towards Building a Virtual Assistant Health Coach", 2018, IEEE:

a. Methodology: This system uses SMART Goal Annotation for annotating specificity, measurability, attainability, realism of goal. Stage phase annotation is used for understanding the structure of health coaching dialogues.

b. Findings and Application: Autonomous health coaching system is used for improving the poor health via sms conversation between patient and health coach.

c. Remark(Future scope and Conclusion): It uses language model to predict the most likely stage and phase tags for each of these topic boundaries, and use them to figure out the most recent and up to date goal of the patient.

[2] Ping-Jing Yang, Wai-Tat Fu "Mindbot: a social based medical virtual assistant", 2016, IEEE:

a. Methodology: This system uses Natural language processing, Machine learning for creating a chatbot.

b. Findings and Application: Virtual agent is used for the improvement of human mental health care. Virtual agent play a role of psychotherapist and form a connection with users.

c. Remark(Future scope and Conclusion): Proposed system reduces the mental health disorder.

[3] Li Chengwei1, Zhang Limei, Hu Xiaoming "The Study on Virtual Medical Instrument Based on Lab View", 2005, IEEE:

a. Methodology: This system used Data science for analysis of data and NLP is used for processing of data.

b. Findings and Application: Signal acquisition, processing and analysis system using lab-view.

c. Remark(Future scope and Conclusion): Virtual medical instrument such as PC based system can be an efficient alternative to standalone medical instrument and as the speed and reliability of the PC increases, there will be more of virtual medical instrument systems available.

[4] Veton Kepuska, Gamal Bohouta "Next-Generation of Virtual Personal Assistants (Microsoft Cortana, Apple Siri, Amazon Alexa and Google Home)" , 2018, IEEE

a. Methodology: This system uses the multi modal dialogue system which processes the user input mode such as speech, image, video, gestures.

b. Findings and Application: Virtual Personal Assistant is used for increasing the interaction between humans and machines. This system can be used for different applications such as education assistance, Medical assistance, robotics and vehicles, home automation system.

c. Remark(Future scope and Conclusion): Virtual personal assistant(VPA) designed to converse with a human, with a coherent structure**.**

[5] Siddhant Rai, Akshayanand Raut, Akash Savaliya, Dr. Radha Shankarmani "Darwin: Convolutional Neural Network based Intelligent Health Assistant", 2018, IEEE

a. Methodology: This system uses Artificial Intelligence(AI), Artificial Neural Network(ANN) and Deep Learning.

b. Findings and Application: Health care assistant will allow users to check for symptoms of common diseases, a suggestion to visit a doctor if needed, exercise recommendation, tracking exercise/workout routine, along with a comprehensive exercise guide.

c. Remark(Future scope and Conclusion): Propose system focuses on human-computer interaction. It is self adapting based on user's past interaction.
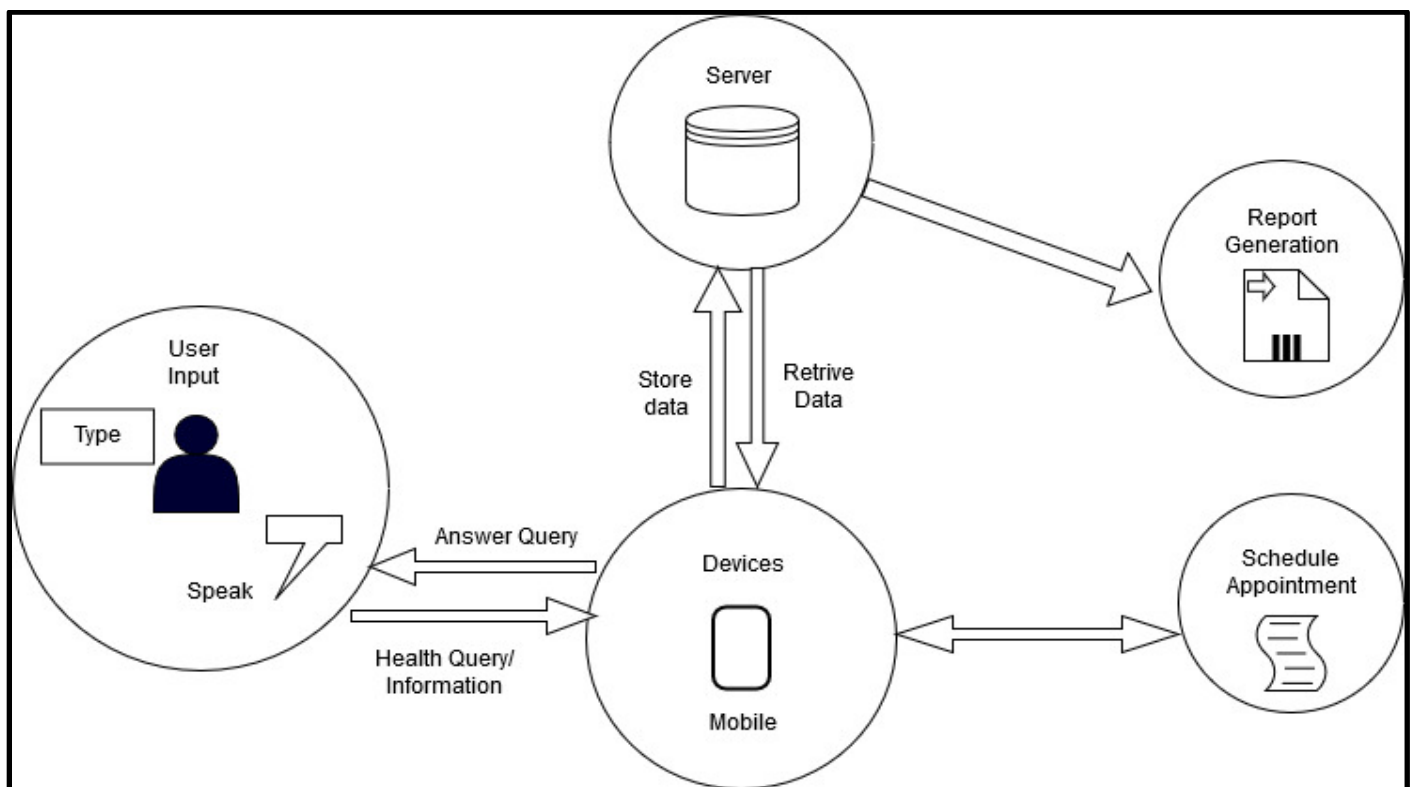
System Architecture:

Figure1:System

Architecture

The architecture of the system is shown in fig1.In this system patient can give the input in the form of query with the help of several algorithms the assistant gives result to the query. Server stores the patient related data and retrieves data as well as generates report .Facilities like schedule appointment of doctors also be provided.
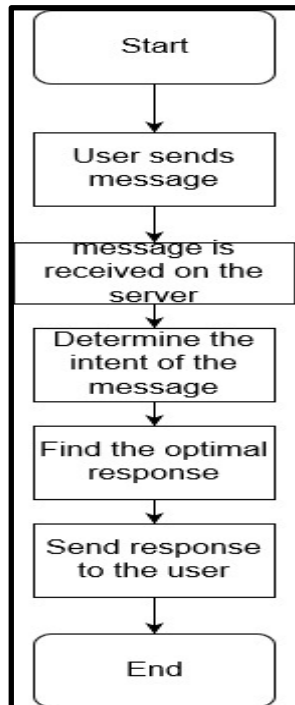
System Flow:

Figure 2: System flow

Future Scope:

Virtual online support:- The scope of this study is the development and implementation of virtually support monitoring system for remote patients using wireless technology. The developed system would inform the doctor in case of emergency through alarms.

Advancements in voice-recognition capabilities could improve physician adoption of virtual assistant technology. Hands-free documentation capabilities during medical procedures .

Introduction to Big Data:- With increase in user data and internationalization, with overhead of databases increasing big data should be handled with efficient algorithm as the access time to historic data must be as short as possible.

Conclusion:

Increasing rate of chronic diseases in an aging population is becoming a serious concern due to lack of sufficient facilities and extremely high cost. The situation is even worse for the people residing in remote areas far from medical facilities as delay in diagnosis and treatment may lead to death. Timely diagnosis and treatment can solve these issues to a great extent. The advancements in wireless communications and wearable sensor technology open up the opportunity of Virtually Assistant for Patient Monitoring systems.

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