

IoT-Based Smart Health Monitoring System for Hostel Students with Facial Recognition and Real-Time Data Analysis.

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ABSTRACT:In order to improve the ability of students staying in dormitories to monitor their health status, a new method based on big data was implemented with the project. This project offers a new health system based on the Internet of Things to improve the overall health and health management of hotel residents. Using technology, the system also includes facial recognition to identify students who enter, allowing for personal tracking and recording of individuals created here, which will help track health information. It uses imaging technology to analyze students' food intake and measure their calorie intake, thus providing better information about their eating habits. Ultrasonic sensors are also used to measure height and determine weight during loading. All collected data is sent to the central IoT platform, enabling authorities to monitor students' health and environmental indicators. The system can detect health risks early through predictive analysis and alert students and administrators to take preventive measures. The system also includes a user-friendly mobile application where students can access their health information, receive personal health advice, and track their progress. This comprehensive approach not only exposes house leaders to health-related issues, but also encourages students to play an active role in managing their personal health. We aim to improve the overall health and education of hotel residents by encouraging healthy lifestyles and providing timely interventions.

I INTRODUCTION

In today's world, it is important to maintain health and well-being, especially for students who live at home and often face special challenges in managing their physical health and nutrition. Recognizing the importance of health care and intervention, the program aims to develop solutions for monitoring and maintaining the physical health of boys studying at home. This project uses advanced technologies such as the Internet of Things and big data analysis to propose smart health solutions, especially for the hotel sector. The system combines various functions, including facial recognition, image processing and measurement, to provide a rapid understanding of student health. The overall goal of the program is to provide dormitory authorities with the tools and information needed to monitor student health and intervene when necessary to support consumer health and wellness. By implementing this new solution, the program aims to solve the specific health problems faced by students at the hotel and contribute to the overall improvement of their physical health and well-being.

II OBJECTIVE

The main goal of the project is to create and implement a new IoT-based system that specifically meets the special needs of student dormitories. The system will integrate various technologies such as facial recognition, imaging, and analytics to monitor student health in real time. A comprehensive student health assessment to manage the health of dormitory students. Write to instantly access your child's information while maintaining the highest data security and privacy standards.

III LITERATURE SURVEY

The Internet of Things (IoT) is indispensable for new applications such as smart cities, smart homes, education, healthcare, transportation, and defense operations. IoT applications are particularly useful in healthcare delivery, as they improve people's quality of life by enabling safe and immediate patient care.[1] This review explores new trends in healthcare through the use of the Internet of Things. The Internet of Things plays an important role in the healthcare of coma patients. Regular healthcare can save up to 60% of people's lives through timely detection.[2] Equipment designed for instant health monitoring of patients in a coma. It is necessary to determine the patient's condition or condition using GSM and IoT. With the onset of the global COVID-19 pandemic, social distancing and isolation have become increasingly important in the world.[3] IoT healthcare can prevent doctor visits and encounters between patients and doctors. However, many people need healthcare and the attention of healthcare personnel. In this work plan, we use this technology to make patients' lives easier for early diagnosis and treatment. Developed smart health monitoring using Internet of Things (IoT) technology that can monitor people's blood pressure, heart rate, blood oxygen level and body temperature. Perform multiple tasks within predefined time, accuracy and cost parameters. [4] This IoT-based system is characterized by low cost and remote operation. The system uses sensors to identify patients' biological parameters, and integration with Arduino increases the efficiency of patient care. There are many researches focused on the development of IoT-based medical devices to meet healthcare needs. For example, nursing.[5]

IV EXISTING & PROPOSED SYSTEM

1. EXISTING SYSTEM

Current health monitoring systems use a combination of IoT devices and sensors to continuously monitor patients' vital signs, especially heart rate and blood pressure. When the system detects abnormal changes in the patient's health, such as abnormal heart rate or abnormal blood pressure, the Arduino board will trigger the GSM module and send a notification to the doctor via SMS, including the current patient. Important Signs and Alerts for Misdiagnosis. The system is also equipped with a GPS module that can report the patient's location in cases where the patient cannot reach the hospital, ensuring that emergency medical help is dispatched quickly. This comprehensive approach allows continuous healthcare to provide timely medical interventions, especially for elderly patients, thereby increasing health benefits and reducing risks associated with delayed treatment.

1.1 DISADVANTAGES

- Despite the new approach of IoT-based smart health monitoring, there are still shortcomings that need to be considered.
- Relying on facial recognition may raise concerns about students' privacy, which may lead to protests or opposition to its use. Risk of disturbing the body, inability to study or fail.
- Continuous monitoring of students' health indicators cannot lead to any impact on evaluation or admission, which will affect the mental health of students at home.

2. PROPOSED SYSTEM

Use of facial recognition devices to allow student dormitories to access designated areas (including public areas). This model will analyze food images captured by the camera to gain a deeper understanding of students' eating habits. These standards will provide accurate height measurements for all students. Provide a mobile phone to measure the student's weight. The module will track the student's weight over time, providing insight into their health status. The platform will enable hostel authorities to regularly monitor students' health indicators. · Provide intervention and support to health management students. Health.

2.1 ADVANTAGES

- There are many advantages to IoT-based smart healthcare for student dormitories. It uses facial recognition technology for personal healthcare to improve the security and accuracy of student identification.
- The system uses imaging technology to understand students’ eating habits in detail by measuring calories consumed, which again leads to better nutrition management. The combination of ultrasonic sensors and load cells supports accurate health measurements by accurately measuring students’ height and weight.
- Hotel management departments can instantly send health information to the central IoT platform to monitor and support health management and time-sensitive interventions. The new system ultimately improves the overall health and wellness management of hotel residents.

V.BLOCK DIAGRAM

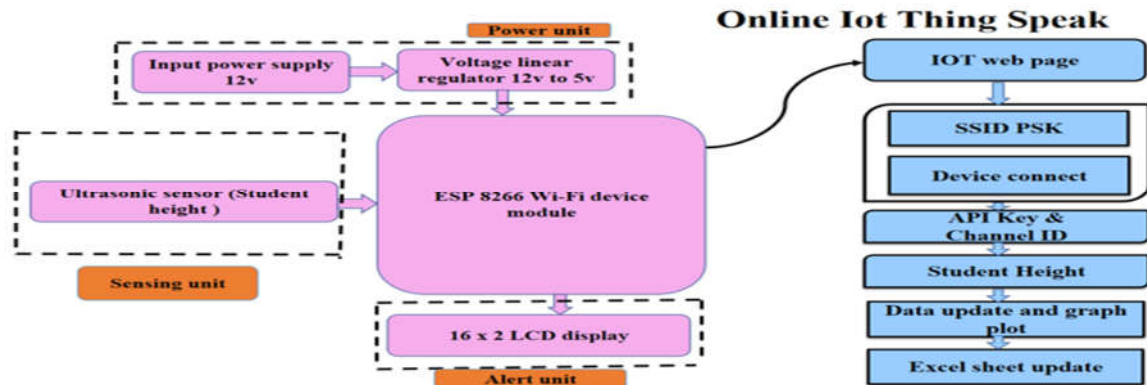


Fig No:1 Hardware Block Diagram

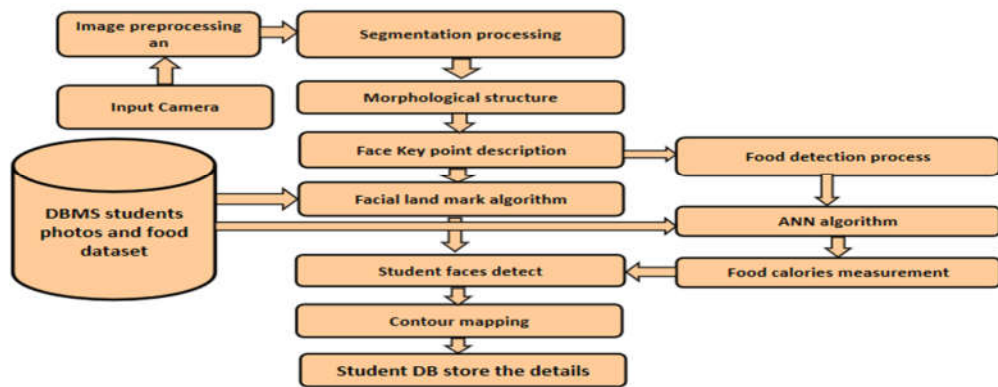


Fig No:2 Software block diagram

VI. HARDWARE SPECIFICATION

1. ARTIFICIAL NEURAL NETWORK

Artificial neural networks are as important in communication as the network of neurons that make up the human brain. Similar to the human brain, which is made up of interconnected neurons, artificial neural networks are also made up of neurons that interact at different layers of the network. These neurons are called nodes. Artificial Neural Networks Tutorial covers everything about Artificial Neural Networks. In this course, we will discuss neural networks, evolution, Kohonen’s eigendiagram, building blocks, unsupervised learning, genetic algorithms, and more. The human brain, so computers can choose to understand and

make decisions like humans. Artificial neural networks are created by programming computers to act like interconnected brains. Each neuron has 1,000 to 100,000 connections. In the human brain, information is stored in a distributed system and when needed, we can store many pieces of information together from memory. It can be said that the human brain consists of very complex systems.

2.IMAGE PROCESSING

In smart health monitoring for students in hotels based on the Internet of Things, imaging plays an important role in improving the accuracy and reliability of the data obtained. In this case, image processing requires several steps to improve the quality of the images captured by the camera integrated into the monitoring system. These steps may include denoising techniques to remove distortions or artifacts in the image, contrast techniques to increase visibility and clarity, and normalization techniques to ensure consistency of pixel values across different images. The operations may also include resizing or cropping images to focus on areas of interest, such as the student's face during face recognition or food during calorie counting. The work, which optimizes the quality and consistency of the input images, provides a basis for accurate and reliable analysis and interpretation of health-related data. The process helps improve the performance of the image after processing algorithms such as face recognition and calorie food measurement by reducing the complexity of the image and the design of the image. This optimization saves computer resources, in addition to being faster, more analysis, and information flow over time. In general, image processing is an important planning step in smart health monitoring to ensure that the captured images are accurate and usable for appropriate analysis.

3.SEGMENTATION PROCESSING

The segmentation in this project involves dividing the entire healthcare system into operational components to facilitate the collection and analysis of quality data. First, the system uses facial recognition technology to identify students as a preliminary segmentation step. Upon login, students' faces are recognized, enabling self-monitoring. The system then uses imaging technology to segment and analyze food images, providing information on calories consumed and food intake. This segmentation process allows the system to focus on specific aspects of healthcare, such as nutrition, in a large population of healthcare students. The student's height and weight. Sensors interrupt the physiological data collection process to ensure measurement accuracy and reliability. The system can divide the healthcare system into separate components and collect data in real time and send it to the central IoT platform. This section improves data collection, analysis and intervention strategies, improving overall healthcare outcomes and ultimately helping to improve the health outcomes of people in the hotel.

4.CONTOUR MAPPING

Contour mapping plays an important role in processing the image stream of the three-level password authentication system, especially in the context of face recognition. After the first image processing step, the contour grid shows how to identify and remove the face based on differences or contours. This method uses the OpenCV library, a powerful tool for computer programming in Python. In the case of face recognition, the contour map allows the system to distinguish and interpret facial features such as eyes, nose, and mouth. This step is important to create an accurate and standard representation of facial geometry and facilitate recognition and verification. OpenCV provides functionality for contour extraction by allowing the system to define contours and represent them as connected points or curves. Once the contours are obtained, specific facial features such as eye edges or nose can be identified. Additionally, the contour map helps eliminate unnecessary details and noise, providing a more robust and simpler facial representation. This centralized representation improves the performance of subsequent stages in the face recognition process by highlighting features that are important for social interaction.

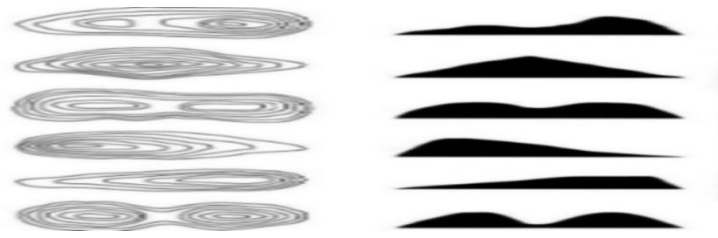


Fig no: 3 Contour mapping

5. STUDENT FACE DETECTED

The face detection function in the IoT-based smart healthcare system plays an important role in providing personalized care to student housing. Using facial recognition technology, the system can quickly detect students entering dormitories. This not only simplifies the data collection process, but also enables accurate monitoring of health indicators for individual students. In addition, the integration of facial recognition adds an additional layer of security, improving the overall safety of the hotel environment. As a result, housing managers can rely on the system to provide personalized and personalized health information, allowing them to adjust interventions and support strategies according to each student’s unique needs. This excellent approach to healthcare creates a good environment for hotel residents to enhance their overall health and well-being.

6. THINGSPEAK WEB PAGE

The Internet of Things (IoT) is a network of “connected things.” These products often have built-in functionality and the ability to communicate with the Internet or nearby products. One of the key elements of the global IoT that connects many “things” together is IoT services. One of the biggest drawbacks of the “things” created by IoT systems is that they can’t all do anything on their own. They must at least be able to connect to other “things.” But the real power of the Internet of Things is used when objects are connected to “services”, either directly or through other “things.” In such a process, services take on the role of invisible controllers that provide tasks such as simple data collection and maintenance of complex data.

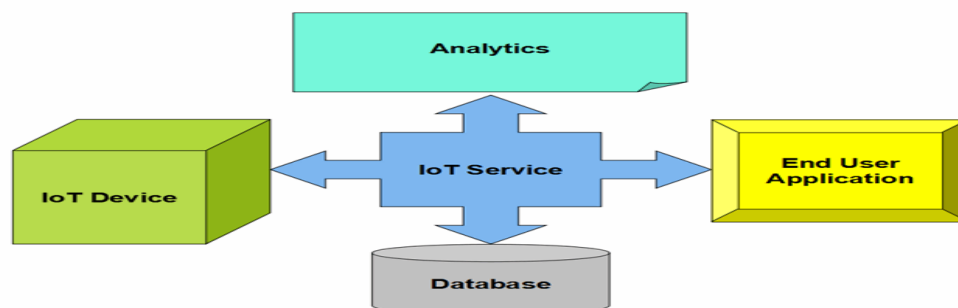


Fig No:4 IOT Web page

7. FOOD DETECTION PROCESS

The food research process of this new IoT-based health system involves the use of image processing technology to analyze the food consumption of student residences. As

students enter the dining area, facial recognition guides them and cameras capture images of them as they eat. These images are then processed to determine and measure the calories burned by each student. The system identifies ingredients and portion sizes, giving students a better understanding of how to eat healthy foods, helping them make healthy eating decisions and encouraging healthy eating habits. Residual weight to increase the accuracy of calorie counting. This food testing process works seamlessly across the health system to ensure the best possible protection of student health. By regularly monitoring dietary patterns and providing prompt feedback, hostel authorities can take significant steps to improve the health of students and encourage them towards health and overall wellness during their stay in hostels.

VII. RESULT

The implementation of smart health monitoring for student dormitories based on the Internet of Things has achieved great results in improving the overall health and well-being of student dormitories. The system uses advanced technologies such as facial recognition, imaging, and ultrasonic sensors to monitor student health indicators. The integration of these features enables fast and accurate tracking of food intake, height, and weight, allowing dormitory authorities to better understand the student's healthy drinking cleanliness. This approach allows administrators to solve urgent health problems, promote healthy lifestyles, and provide timely assistance when necessary, thus improving everything in the hotel and its health.

VIII. CONCLUSION

In summary, the program has launched a new IoT-based smart health system specifically designed to improve the overall health and health management of student dormitories. The system uses modern technologies such as facial recognition, image processing, ultrasonic sensors, and weight sensors to monitor students' physical health, nutrition, height, and weight. Seamless data transmission to the central IoT platform allows hostel authorities to monitor students' health indicators and carefully resolve any issues that may arise. This holistic approach not only promotes a healthy lifestyle, but also helps improve the health and well-being of hotel residents by facilitating timely interventions.

IX. REFERENCES

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