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Dhenu Svasthya Bot: An AI driven well-being and health monitoring setup for science and engineering applications

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Abstract
In this paper, an AI driven well-being and health monitoring set-up for the science & engineering applications is being presented. "Dhenu Svasthya" represents an initiative at the intersection of agriculture, animal welfare, and artificial intelligence. This project's primary mission is to significantly enhance the overall health and living conditions of cattle, with a focus on improving their well-being and productivity. At the core of "Dhenu Svasthya" lies a sophisticated health monitoring system. Utilizing advanced AI ML method this system continuously tracks and analyzes key health indicators in cattle. It observes and records jaw movements, heart rate, acetone levels, bellowing patterns, and body temperature in real-time. The objective is to detect anomalies, deviations, or early signs of distress promptly. This proactive approach enables timely intervention by cattle owners, reducing the likelihood of disease and ensuring the optimal health of the animals. Environmental Cleanliness is another pivotal aspect of the project is the assessment of the cattle's living environment. Maintaining a clean and hygienic space is paramount for the cattle's well-being. "Dhenu Svasthya" deploys AI technology to evaluate the cleanliness of the surroundings. The system provides actionable insights to users, allowing them to address potential cleanliness issues promptly and maintain a healthier living environment for their cattle. To extend the project's reach and accessibility, we are actively working on integrating "Dhenu Svasthya" with cloud services and other data management platforms. It aims to empower cattle owners and farmers with the information and insights needed for effective cattle management, thereby improving overall livestock welfare. In summary, "Dhenu Svasthya" is an ambitious undertaking that leverages AI to usher in a new era of cattle care. By continuously monitoring health, ensuring environmental cleanliness, and embracing data integration, this project aspires to be a game-changer in the field of livestock management. Its overarching goal is to promote the well-being of cattle, enhance agricultural sustainability, and ultimately benefit both the animals and those who depend on them for their livelihoods. The work carried out is the seventh semester main-project by the students of Electronics & Communication Engineering under the guidance of the faculties supervision (guide).

Introduction

The "Dhenu Svasthya" project is born out of the growing need to address the well-being of cattle, which play a pivotal role in global agriculture and food production. Cattle are not only a source of sustenance but also significant contributors to economies. Traditionally, cattle care has relied on manual observation and periodic veterinary visits. However, with the advancements in artificial

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intelligence (AI) there is an opportunity to revolutionize the way we monitor and manage cattle health. Dhenu Svasthya leverages AI to provide real-time insights into the health of cattle. This includes monitoring vital signs, recognizing the significance of the cattle's living environment, the project extends its focus to cleanliness assessment. Clean and hygienic conditions are essential for the well-being of animals. Incorporating cloud and data integration into the project allows for remote access to critical data, making it easier for cattle owners and farmers to make informed decisions and take timely actions.

Block-diagram

The proposed block-diagram of the project work is shown in the Fig. 1 where, the body temperature sensor, heart beat sensor, pulse oximeter, accelerometer, dirtiness monitoring is being presented.

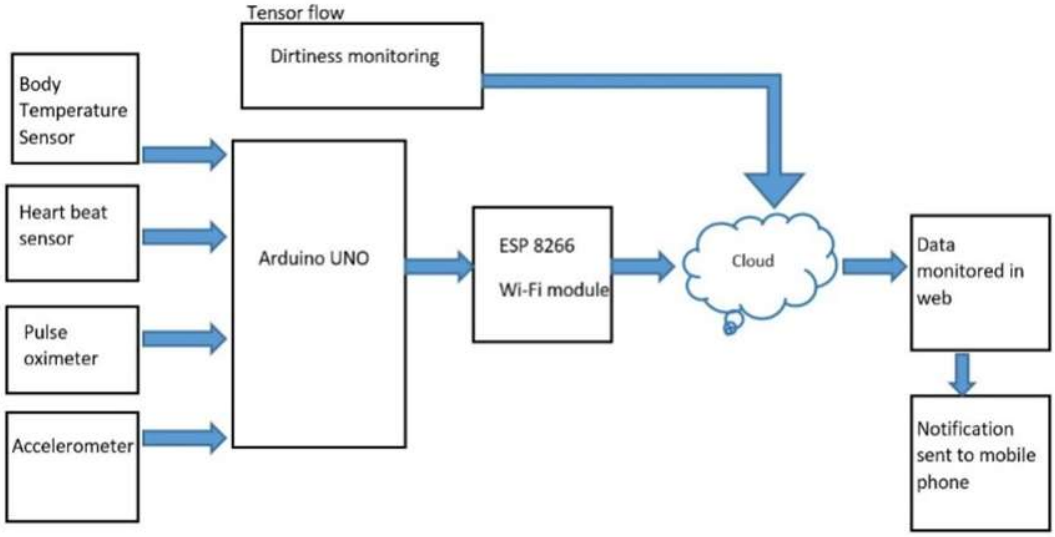

Fig. 1 : Proposed block-diagram of the project work

Objective

To develop an AI and IoT-powered cattle health and safety monitoring system that utilizes machine learning and computer vision to continuously assess the well-being of livestock, detect early signs of diseases, and ensure the safety of cattle in order, along with continuous monitoring of cleanliness of the byre to improve animal welfare and enhance farm productivity.

Aim

To design an AI driven bot for the well-being and health monitoring for cattle

Proposed methodology

Monitoring of health and safety of cattle along with the continuous monitoring of byre using Al and IoT model.

Working of the main project module

The raw data of the cattle health are collected from sensors and stored in cloud, then the data is analyzed and data is monitored in web and the information is sent as notification to the client phone.

Tools used (hardware / software)

Arduino UNO, C++ programming, Temperature sensor DS18B20, Pulse Oximeter MAX30100, Accelerometer ADXL335, Gas Sensor MQ138, Microphone KY-037, WIFI module, python, tensor flow, think speak.

Applications &Advantages

The Bot is an integrated sensors which collect health related parameters that is tied around the neck off the cattle. The important application of cattle health monitoring is Disease Detection and Prevention, Heat Stress Management, Behavioral Analysis, Identification and Tracking and

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environment cleanliness. Advantages include early disease detection, increase profitability-the combination of improved cattle health, reduced labor costs….

Expected Outcome

Dhenu Svasthya collects various health related data which is analyzed for the earlier disease detection, Behavioral analysis, Identification and tracking, Alerts and notification and weight & growth monitoring. Also, the surrounding environment observation helps to grow cattle in a healthy life.

Conclusions

In conclusion, the Dhenu Svasthya Bot project represents a significant advancement in the field of well-being and health monitoring, particularly in the context of science and engineering applications. By harnessing the capabilities of artificial intelligence, this project offers a versatile and data-driven solution for monitoring and enhancing health and well-being. It has the potential to revolutionize the way individuals in scientific and engineering fields manage their health, providing real-time insights and support. The AI-driven well-being and health monitoring setup can be adapted for various applications, including tracking physical and mental health, managing stress, and improving overall quality of life. It not only promotes a healthier and more productive workforce but also contributes to the well-being of individuals, enhancing their ability to excel in demanding scientific and engineering roles. The Dhenu Svasthya Bot is a testament to the power of technology in promoting health and well-being in the workplace, ultimately benefiting both individuals and the organizations they serve.

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