Retraction

Retraction: Smart Health Monitoring Bodyarea Network Using Raspberry Pi (J. Phys.: Conf. Ser. 1916 012218)

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This article (and all articles in the proceedings volume relating to the same conference) has been retracted by IOP Publishing following an extensive investigation in line with the COPE guidelines. This investigation has uncovered evidence of systematic manipulation of the publication process and considerable citation manipulation.

IOP Publishing respectfully requests that readers consider all work within this volume potentially unreliable, as the volume has not been through a credible peer review process.

IOP Publishing regrets that our usual quality checks did not identify these issues before publication, and have since put additional measures in place to try to prevent these issues from reoccurring. IOP Publishing wishes to credit anonymous whistleblowers and the Problematic Paper Screener [1] for bringing some of the above issues to our attention, prompting us to investigate further.

[1] Cabanac G, Labbé C and Magazinov A 2021 arXiv:2107.06751v1

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Smart Health Monitoring Bodyarea Network Using Raspberry Pi

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Abstract. In today’s world more death occurs due to not immediate treatment for bed ridden patients. It also requires more man power. This document presents the model, installation and looks of a hardware and software platform for health monitoring system for patients. The main purpose of this system is to set up a system that can watch over bedridden patient’s health. This project depends on both hardware and software. It is developed using sp02, temperature, heartbeat connected to a raspberry pi micro controller, which get the sensor values and process it in machine learning process to produce a dosage prediction. It also intimates the doctor by triggering an automatic email. In addition, one can know the patients records and prediction of dosage from anywhere using the mobile application linked with it.

Keywords: healthcare system, raspberry pi, Machine learning, SVM, MQTT

1. INTRODUCTION

In our daily lives, health care is very important. With proper treatment, health problems can be detected and prevented early. Many medical devices such as CT, MRI, PET, and others can easily diagnose disease within our body or under the skin. In addition, other rare diseases, such as heart disease, can be easily prevented in infants [1].

The unpredictable spread of degenerative diseases in large numbers has created a crisis in modern health care systems, and the need for funding everything from hospital beds to doctors and nurses is very high. It is necessary to reduce the burden on health care systems in order to maintain the highest quality and quality of care [2].

The internet of Things (IoT) will help alleviate some of the difficulties in medical care systems. Prior to this, patients with diabetes were tested, as well as patients with certain infections, such as Parkinson's disease. Because there is so much information in today's world, land, data processing, storage, and analysis should be considered, but little is said about the inclusion of those in the structures proposed to provide reliable data transmission. Managers have made a fuss over data security and the IoT tool, which has plagued medical and IT management managers [3].
AI should be considered as a small group of artificial thinking (AI). Using a man-made concept, we will build a better and more prosperous future. Without deliberate modification, AI can be an expert in capturing trusted and knowledgeable points. Instead of coding, data is consolidated in traditional censuses, and data-based correction is provided. Web browsing, spam filtering, ad-placement, stock trading, and other activities are all taught by AI. Apart from the fact that the discovery of this wealth of knowledge is expected to lead to great advances in science and design and development in the natural world, it results in great experiences simultaneously. According to a report by the McKinsey Global Institute, AI will be the driving force behind significant growth. Internet of Things (IoT) looks at the ability to interact remotely and use the Internet to verify authentic information (objects). AI is now widely used in a variety of business applications, including the web-based business and others [4].

The act of extracting data collection from large amounts of data is known as data modification. Our topic is a prediction of the disease using patient databases and information about patients that we need to see if there is a possibility of illness. Figure 1 shows the block diagram.

2. MODULES AND METHODS

This smart health monitoring system comprises of three sections:

- **Health Monitoring Section**
- **Health status prediction system**
- **Emergency Alert Section**

![Figure 1. block diagram](Retracted)

### 2.1 HEALTH MONITORING SECTION

In this section the modules is fully of hardware components. The sensors connected to the Micro controller will sense the health parameters continuously. the micro controller used here is Raspberry pi 3.

The Raspberry Pi is a credit card-sized open-source Linux-based microcontroller. This micro controller can do many things that a desktop computer can do, such as surf the internet and play video, by connecting to your TV or monitor and a standard keyboard, and with the right programming. This Raspberry Pi is also ideal for those who want to try out new projects; newer versions, due to their processing power, are ideal for Internet of Things projects. The Raspberry Pi 3 with built-in WiFi is 10 times faster than the first generation. VNC viewer is used as medium for communication between two computers as shown in Figure 2.
Figure 2. RASPBERRY PI 3 Three

sensors are used in this module.

**TEMPERATURE SENSOR**

This sensor measures the temperature of the body. The normal temperature will range from 36.5–37.5°C (97.7–99.5°F).

**HEART BEAT SENSOR**

Heart beat is the rate at which the heart pumps blood. The heart beat rate can indicate one’s illness. A normal human heart beat ranges from 60 to 100 beats per minute.

**SPO2 SENSOR**

It is also known as pulse oximeter. This sensor measures the percentage of oxygen in one's blood level. The normal oxygen level ranges from 95% to 100%. The brain will be affected if the oxygen level falls below 85%.

These sensors will sense the values and will give values which will be an analog value. Since the raspberry pi has only digital pins we want to use a ADC (Analog to Digital Converter). These values will be coordinated using Raspberry pi.

**2.2 HEALTH STATUS PREDICTION SYSTEM**

Even though the values are taken it will be processed only by using software part (programming). We use an OS capable with Raspberry called RAHI. The programming for the sensors to work are all typed in that and stored.

This section is fully compromised of software part where the machine learning starts to take place.

**2.3 EMERGENCY ALERT SECTION**

This section is small one, but plays an important role in this system. This module focuses on the steps to take after a patient’s health has been identified abnormally, such as notifying his or her family as well as the hospital. In our programme, we’ve set up some values that, if crossed, will send an email to the patient’s family and doctor.

In addition to the mail, one can also view the patient's health parameters and prediction from anywhere by using a mobile application called MQTT.

MQTT is an open source application that can be used to send messages or data between two AI machines.

In this application, one can check the patient's health if the broker URL and port number is known.

**3. MACHINE LEARNING**

Machine learning is a part of Artificial Intelligence (AI) based on the impression of allowing machines to learn by giving them access to data and investigate on their own. It is concerned with extracting
Patterns from large data sets. Without being specifically programmed, machine learning allows a machine to learn from data, improve performance through experience, and predict things. Machine learning is becoming increasingly important. The reason for the requirement for machine learning is that it is capable of performing tasks that are too difficult for a human to perform directly. We will save both time and money with the help of machine learning. Machine learning's importance is often best understood through its applications. For example, machine learning is currently used in self-driving cars, cyber fraud detection, face recognition, and Facebook friend suggestion, among other things. Several major companies, such as Netflix and Amazon, have developed machine learning models that use a large amount of data to analyze user interests and recommend products accordingly [6-8].

There are various types of machine learning algorithms available. Here in this module we used SVM (Support Vector Machine) algorithm.

**SVM**

SVM types are frequently used in conjunction with neural networks. In fact, the sigmoid kernel SVM model works similarly in a two-layer network of perceptron neural. Support Vector Machine (SVM) models are a close relative of traditional multilayer perceptron neural SVMs networks that measure other polynomial training, radial base perform, and many perceptron classification classifiers using kernel perform. Network weights are obtained by solving a quadratic system problem with specific issues, rather than non-convex, in the problem of reduced freedom, as in traditional neural network training.

We will already be adding datasets to a system that compromises on medical dosage. SVM is the number of AI scenarios used to solve editing problems. Due to SVM's high level of success in planning, it is widely used in various programs.

Events are classified by hyper $w^T x + b = 0$, where $w$ and $b$ are coefficient of surface-standard dimensional vectors, $b$ is a motivator adjusted from the earliest starting point stage, and $x$ is an enlightenment assortment of regards in a two Problem of splitting size.

Using past data sets and the current sensor data system system will predict patient health, whether normal or not. Predict volume using data sets.

**4. RESULTS**

![Figure 3. Hardware section](image)

After connecting this hardware section to the software we can run the system and know the results as shown in Figure 3.
Figure 4. datasets

The figure 4 shows some of the datasets we have entered for our prototype. Where temp = temperature, hb = heart beat, bp = oxygen level. Target= to take action certain number is assigned. This datasets will determine the final prediction and dosage.

Figure 5. Health status and dosage prediction

After running the program we can get this output with the health status and dosage prediction as shown in Figure 5. It will trigger the mail to the respective person or doctor.

Figure 6. Mail triggered by the system

Figure 6 demonstrate the mail triggered by the system it is also customizable with more information.

As said these information can accessed from anywhere if the credentials are known. The figure 7 shows the output in the MQTT application. It consists of the sensor values followed by predictions. we can also send more data in application if wanted.
5. CONCLUSION

This project is developed as a tool to keep track of one's wellbeing parameters of the patient Raspberry Pi 3. This work is designed to provide a safety system for the patients. We proposed continuous monitoring of the patient conditions and save the patient's data in the cloud using the IOT concept.

Heartbeat sensor and temperature sensor are interfaced with Raspberry pi 3. MQTT displays the heartbeat and temperature of the patient continuously. It has inbuilt Wi-Fi so it stores the sensors data in the cloud through Wi-Fi web server for access from anywhere in the world by opening the web server in mobile or laptop.

The status will display on LCD. This Intelligent process can be done by using Embedded LINUX programming language. In the future, we can also interface several other health-based sensors like ECG sensors and EMG sensor. At the same time, we can also use a touch sensor which is used to get the information from the patient when he is in a panic.

The touchpad is used in such a way that the patient can touch the pad to inform others about his needs in the form of audio.

REFERENCES

[1] Smart Mirror using Raspberry Pi, International Journal of Recent Trends in Engineering and Research, vol. 4, no. 3, pp. 353–358, Mar. 2018.
[2] S. Zeadally and O. Bello, Harnessing the power of Internet of Things based connectivity to improve healthcare, Internet of Things, p. 100074, Jul. 2019.
[3] IOT BASED PATIENT HEALTH MONITORING SYSTEM, International Journal of Advance Engineering and Research Development, vol. 4, no. 06, Jun. 2017.
[4] M. Suganya and H. Anandakumar, Handover based spectrum allocation in cognitive radio networks, 2013 International Conference on Green Computing, Communication and Conservation of Energy (ICGCE), Dec. 2013. doi:10.1109/icgce.2013.6823431. doi:10.4018/978-1-5225-5246-8.ch012
[5] Haldorai and A. Ramu, An Intelligent-Based Wavelet Classifier for Accurate Prediction of Breast Cancer, Intelligent Multidimensional Data and Image Processing, pp. 306–319.
[6] Ahmed, G. Jeon, and F. Piccialli, A Deep Learning-based Smart Healthcare System for
Patient’s Discomfort Detection at the Edge of Internet of Things, IEEE Internet of Things Journal, pp. 1–1, 2021.

[7] N. Mekki, M. Hamdi, T. Aguili, and T.-H. Kim, Scenario-based Vulnerability Analysis in IoT-based Patient Monitoring System, Proceedings of the 14th International Joint Conference on e-Business and Telecommunications, 2017.

[8] Y. E. Gelogo and H.-K. Kim, Internet of Things (IoT) for U-healthcare Convergence Application, Dec. 2015.