



## *Health Monitoring System Using Raspberry PI and Internet of Things*

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**Abstract**— Wireless, remote patient monitoring system and control using feedback and GSM technology is used to monitor the different parameters of an ICU patient remotely and also control over medicine dosage is provided. Measurement of vital parameters can be done remotely and under risk developing situation can be conveyed to the physician with alarm triggering systems in order to initiate the proper control actions. In the implemented system a reliable and efficient real time remote patient monitoring system that can play a vital role in providing better patient care is developed. This system enables expert doctors to monitor vital parameters viz. body temperature, blood pressure and heart rate of patients in remote areas of hospital as well as he can monitor the patient when he is out of the premises. The system in addition also provides a feedback to control the dosage of medicine to the patient as guided by the doctor remotely, in response to the health condition message received by the doctor. Mobile phones transfer measured parameters via SMS to clinicians for further analysis or diagnosis..

**Keywords**- Raspberry PI, Internet of Things.

### I. INTRODUCTION

The paper presents the design and implementation of IOT-based health monitoring system for emergency medical services and for household patients which can demonstrate collection, integration, and interoperation of IoT data flexibly .using a Raspberry pi third generation microcomputer development board. The proposed model enables users to improve health related risks and reduce healthcare costs by collecting, recording, analysing and sharing large data streams in real time and efficiently. The idea of this project came so to reduce the headache of patient to visit to doctor every time he need to check his blood pressure, heart beat rate, temperature etc. With the help of this proposal the time of both patients and doctors are saved and doctors can also help in emergency scenario as much as possible. The proposed outcome of the project is to give proper and efficient medical services to patients by connecting and collecting data information through health status monitors which would include patient's heart rate,

blood pressure and ECG and sends an emergency alert to patient's doctor with his current status and full medical information.

Capturing and sharing of vital data of the network connected devices through secure service layer is what defines IOT. In simple terms, Internet of Things (IOT) can be defined as the wireless network of devices which are connected to each other to share information and data in order to communicate and produce new information so as to record and analyse it for future use. Internet of Things gains its full potential by utilizing the key role playing objects i.e. "Smart" objects which use various sensors and actuators that are able to perceive their context, and via built in networking capabilities they could communicate to each other, access the open source Internet services and interact with the human world. This not only makes the world connected but also robust and comfortable. The Internet of things in the field of healthcare also plays a major role in providing ease to patients and doctors. It consists of a system that communicates between network connected systems, apps and devices that can help patients and doctors to monitor, track and record patients' vital data and medical information. Some of the devices include smart meters, wearable health bands, and fitness shoes. RFID based smart watches and smart video cameras. Also, apps for smart phones also help in keeping a medical record with real time alert and emergency services observation.  
proof.

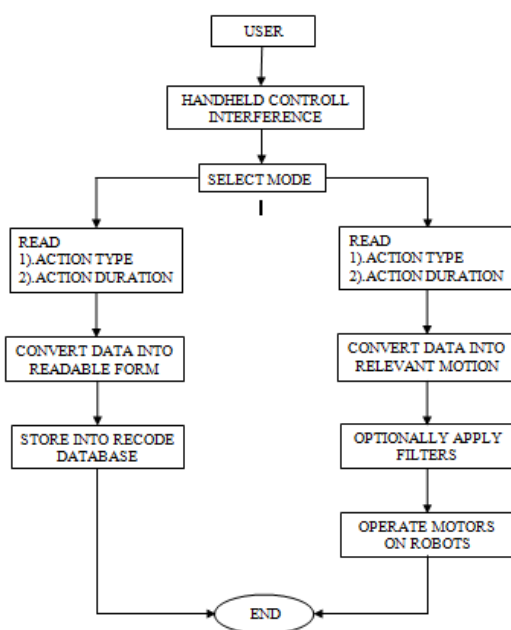
### II. WORKING PRINCIPLE

At present, due to busy life style health negligence on is increased which causes in large number of dieses among people. And every time visiting a doctor is not an easy option for patients so this system will keep track of patients activity and his vitals. And send them to remote servers from where it can be accessed by doctors as well as patient himself.

In the implemented system a reliable and efficient real time remote patient monitoring system that can play a vital role in providing better patient care is developed. This system enables expert doctors to monitor vital parameters viz body temperature, blood pressure and heart rate of patients in remote areas of hospital as well as he can monitor the patient when he is out of the premises. The system in addition also provides a feedback to control the dosage of medicine to the patient as guided by the doctor remotely, in response to the health condition message received by the doctor. Mobile phones transfer measured parameters via SMS to clinicians for further analysis or diagnosis. The timely manner of conveying the real time monitored parameter to the doctor and control action taken by him is given high priority which is very much needed and which is the uniqueness of the developed system.

1 The main idea of the proposed system is to provide better and efficient health services to the patients by implementing a networked information cloud so that the experts and doctors could make use of this data and provide a fast and an efficient solution. The final model will be well equipped with the features where doctor can examine his patient from anywhere and anytime. Emergency scenario to send an emergency mail or message to the doctor with patient's current status and full medical information can also be worked on. The proposed model can also be deployed as a mobile app so that the model becomes more mobile and easy to access anywhere across the globe complexity.

### III. PROPOSED METHODOLOGY



### IV. DISCUSSION

- Mimic human action according to the instructions stored by the programmer during the learning phase.

- The objective of the system is to perform one task autonomously and can be reprogramming for different task.
- Another feature of the system is multiple experiences storage capability like cleaning particular surface and pick and place any object.
- Filters used to edit and add additional effects during the replay, here effect can be used for editing the speed of robotic arm.
- Raspberry PI is more faster processor than intell gallilio so provide fast and more accuracy.
- Ram and memory of Raspberry PI is 1 GB and 16gb so data can be stored locally.
- Raspberry PI can be programmed remotely through internet while gallilio required laptop or computer to programming.
- Raspberry PI doesn't require any external software or hardware to interface display it has inbuilt HDMI output for high resolution display.
- In previous paper data stored on local server using XAMPP server . In ours data is stored on internet.
- Web page will be responsive can be accessed on any mobile device or PC or Laptop.

### V. CONCLUSION

A learning system can be developed which is trainable industrial robotic arm based on experience replay learning technique. With the development of this project, a experience learning based algorithm can developed that can be used in various modular robots to achieve real time scalability, and functionality reconfiguration. This project will provide a wired module to enable wired control of the robotic arm via developed handheld controller to record action & convert them into devised motion codes and vice-versa. Additional filter section is there to edit or add effects during the replay action.

In the implemented system a reliable and efficient real time remote patient monitoring system that can play a vital role in providing better patient care is developed. This system enables expert doctors to monitor vital parameters viz body temperature, blood pressure and heart rate of patients in remote areas of hospital as well as he can monitor the patient when he is out of the premises. The system in addition also provides a feedback to control the dosage of medicine to the patient as guided by the doctor remotely, in response to the health condition message received by the doctor. Mobile phones transfer measured parameters via SMS to clinicians for further analysis or diagnosis. The timely manner of conveying the real time monitored parameter to the doctor and control action taken by him is given high priority which is very much needed and which is the uniqueness of the developed system. At present, industrial automation requires wide number of

machines for repeatedly done the same number of action. The main difficulty to design such a system is complex programming and constant operating speed. So it can be overcome by design & develop a robotic arm based on experience learning approaches which work on real time. An industrial robotic arm based on experience replay learning technique.

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