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Smart Working Gear System

A.Ragini[1] | Manjot Kaur[2]

[1]M.E. Student, Department of E.C.E, Stanley College of Engineering and Technology for Women, Hyderabad
[2]Assistant Professor, Department of E.C.E, Stanley College of Engineering and Technology for Women, Hyderabad

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ABSTRACT

Controlling the contact force and planning approaching motion are two of the most challenging aspects of manipulating items with robot hands. We describe three types of MEMS sensors for robots that sense contact forces, slippage, and object distance to enable dexterous manipulation of things with robot-hands in this study. Standing piezoresistive cantilevers and beams embedded in PDMS or a viscous liquid are proposed as touch sensors. The contact force may be quantified by the resistance changes of the structures implanted in the PDMS, because the standing cantilevers and beams flex with the PDMS. In addition, the viscous liquid surrounding the cantilever acts as a high-pass filter, allowing the contact forces to be detected over time. We also propose an ultrasonic reflection-based proximity sensor for detecting the distance between robot hands and the things to be grasped. Approaching and manipulation will be possible by combining the suggested three types of MEMS sensors on a robot-hand. This will broaden the range of applications for the future robot as a personal helper.AnyAndroid-powered smartphone, tablet, or other device with a touch screen may perform remote control through a GUI (Graphical User Interface). The android application device transmitter works as a remote control with a good range, while the receiver has a Bluetooth device that is sent to the microcontroller and used to operate DC motors through a motor driver IC.

KEYWORDS: MEMS sensor, Thingspeak, robot.

I.INTRODUCTION

An embedded system is a computer that is designed to execute one or more specific operations, usually under time restrictions. It is frequently integrated as part of a larger device that includes hardware and mechanical components. A general-purpose computer, such as a personal computer (PC), on the other hand, is designed to be versatile and meet a wide range of end-user needs. These systems are controlled by one or more primary processing cores, which are generally microcontrollers or digital signal processors, and they manage a wide range of devices in widespread usage today (DSP). The most important aspect, though, is that it is committed to a single activity, which might necessitate extremely powerful processors. Traffic control systems, for example, might be thought of as embedded, despite the fact that they include mainframe computers and specialised regional and national networks connecting airports and radar stations.

Because the embedded system is dedicated to performing certain functions, design engineers may optimise it to reduce the size and cost of the product while increasing its dependability and performance. Only a small percentage of embedded systems are mass-produced to take advantage of economies of scale. Embedded systems include everything from small handheld gadgets like digital watches and MP3 players to huge fixed installations like traffic lights, industrial controls, and a system for regulating nuclear power plants. The system's complexity ranges from minimal (one microcontroller chip) to extremely high (many units, peripherals, and networks placed inside a large chassis or enclosure).

STRUCTURE OF THE PAPER:

The paper is organized as follows: In Section 1, the introduction of the paper is provided along with the structure of the paper. In Section2, we discuss related work. In Section3, we havethe complete information about smart working gear system. Section4shares information about the block diagram, hardware connection. Section5 tellsus aboutthe flow chart and result. Section6 tells us about the future scope and concludes the paper with acknowledgement and references.

II. RELATED WORK

There are numerous works that have been done related to smart workingIoT systems.

Aakash Bansal, Varun Goyal et. al [1] worked on Real Time Electricity Monitoring using Smart Energy Meter in a Smart LAN based Network. The major goal of the smart energy metre is to identify energy theft in local power distribution across the country. To do this, the server performs real-time analysis and reports on power use on a regular basis. Energy theft incidents are predicted as sudden changes in the received data at the server end.

Md. TaslimArefin, Mohammad Hanif Ali, A.K.M. Fazlul Haque et. al [2] in their work on A Comparative Analysis of Short Range Wireless Protocols For Wireless Sensor Network. This study focuses on a comparison of protocol standards in order to assess their key characteristics and behaviours. This research employed a variety of performance parameters, including transmission duration, bit error rate, received power, packet delivery ratio, and power usage.

N. Mahalakshmi, E. Elavarasi et. al [3] worked on Design of Intelligent SMS Based Remote Metering System for AC Power Distribution to HT and EHT Consumers. This article proposes a novel approach to developing a tamperproof, cost-effective, quick, accurate, and remote metering device for use at any level of the distribution system. The technology enables precise and adequate data to be retrieved from metering devices in order to monitor electrical characteristics without the need for energy metres or human interaction.

Malka Tarannu, Durga Sharma,Dr Dharmendra Singh et. al [4] in their work on Electricity Theft in India: Its Measure and Solution. The impact of power theft on power distribution is investigated. The study discusses how the intensity of tube-well use, which is connected to unmetered electricity use by farmers, increases the risk of power theft. Power theft methods are addressed, as well as different control strategies.

III. SMART WORKING GEAR SYSTEM

1. RPS: Regardless of ac mains fluctuations or load changes, a regulated power supply circuit is designed to deliver a constant dc voltage of a preset value across load terminals. Every module in the Smart working gear system receives a 5v dc from this circuit.

2. LPC2148: In this project, the LPC2148 is utilised as the MCU. It gathers data from several sensors and connects to the IoT module. It also regulates the circuit's overall power usage. It's a 32-bit general-purpose microprocessor with excellent performance and low power consumption. Philips (NXP Semiconductor) created the LPC2148 microcontroller, which has numerous built-in capabilities and peripherals. Because of these factors, it will be a more dependable and efficient alternative for an application developer.

3. MEMS sensor: The MEMS sensor allows the vehicle to navigate in any direction. If the sensor is oriented to the right, the vehicle will move to the right side. If the sensor is oriented to the left, the vehicle will travel to the left side. The car goes forward if the sensor is oriented towards the front. The car travels backwards if the sensor is oriented to the back.

4. PIR Sensor: The PIR Sensor is used to detect the existence of an impediment in front of the vehicle so that the driver may lower the vehicle's speed. In this project, the system can detect an obstruction 30cm distant from the sensor, and if the PIR sensor detects any item, it shows it on the LCD. We can expand the range up to 10 metres in real time.

5. Fire Sensor: A fire sensor detects smoke content in the

vehicle. Because we know that engine failure leads to vehicle damage and, as a result, more smoke is produced from the vehicle, we designed the system in such a way that it detects smoke if it reaches a threshold value of 45 percent and displays the information on an LCD. If there is smoke, the display reads 'YS'; otherwise, it reads 'NO.'

6. Voice IC: The APR9600 device has genuine single-chip voice recording, non-volatile storage, and a 40- to 60-second replay capability. Multiple messages can be accessed in both a random and sequential manner on the device.

7. L293D Driver IC: The L293D is a typical motor driver or motor driver IC that can operate a DC motor in either direction. The L293D is a 16-pin IC that can drive two DC motors in any direction at the same time. It means that a single L293D IC can operate two DC motors. Integrated circuit fordual H-bridge motor drivers (IC).

The sensors are set to wake up every minute in order to maintain track of the data in the surroundings. The data from fixed sensor nodes is sent to the base station. It shows the data in a Thingspeak GUI for the owner's reference if the automobile is not driven by the owner at any point.

IV. BLOCK DIAGRAM

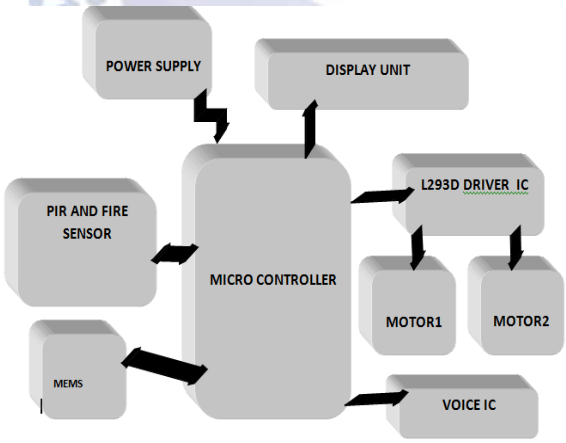


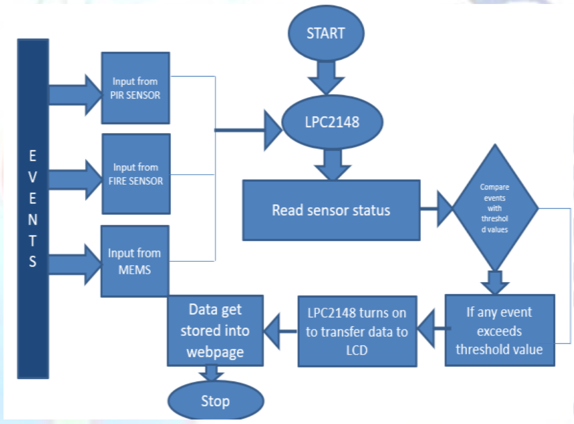
Fig.1 Block diagram of smart working gear system

Hardware connection:

The MEMS sensor is utilised in this project to drive the vehicle in a certain direction, such as right, left, forward, or backward. The item near the car is detected by the infrared sensor. The Fire sensor detects smoke in the surroundings and displays it as YS on the LCD. The L293D IC driver is used to drive two DC motors in the vehicle in the same direction at the same time. In this project, the IoTmodule is utilised to send data from the ARM controller to the THINGSPEAK website.

Fig 2: Smart Working Gear System

V. FLOWCHART



The following diagram makes it easier to understand how we proceed.

Using the wireless method to link the MEMS sensor to the ARM LPC2148 microcontroller at the device end. The web application must be connected to the cloud server and system. We may now use the programme to monitor and control electrical gadgets.

RESULT:

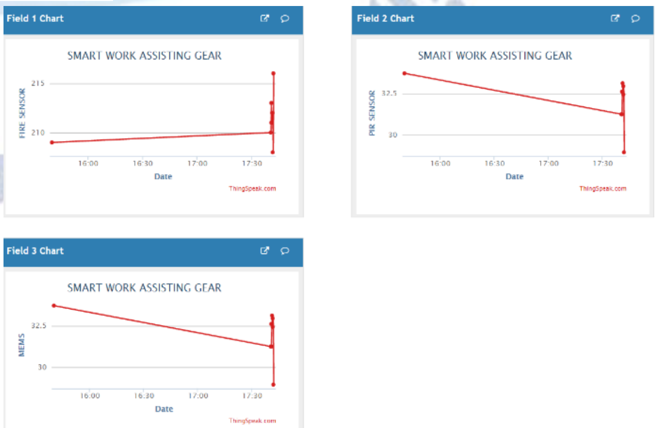


Fig 3: Fire, Object Detection Before VehicleAndMEMS Results From Sensor Nodes

Thingspeak used graphical representation to record and store data from the fire sensor, PIR sensor, and MEMS sensor.

VI. FUTURE SCOPE AND CONCLUSION

Finally, this study emphasises the signifinance of sensor improvements. Sensor priority research can assist us identify where electrical component advancement can be most beneficial. The primary review of the technology and industry developments offers an indication of what the present and future status of wearables is. Various sectors use different applications, and certain sensors are more significant than others.

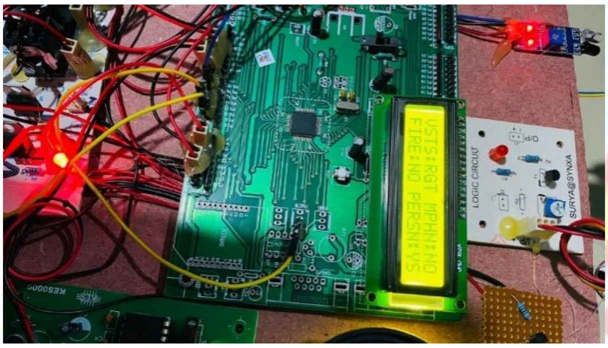


Fig 4: Result displayd on LCD

Current technical restrictions have an impact on design choices. To understand how data is maintained in sport terms for performance and injury monitoring, it is critical to describe essential aspects that revolve around consumer wearables in hardware. Software is much more crucial, because feedback is where the wearable's true use is discovered. More study into how certain types of sensors produce varied readings may be done, according to this review paper, and future investigations into user experience might be extremely beneficial.

REFERENCES

[1] Aakash Bansal, Varun Goyal, Real Time Electricity Monitoring using Smart Energy Meter in a Smart LAN based Network, International Journal of Electronics, Electrical and Computational System, IJEECS,ISSN 2348-117X, Volume 6, Issue 5, May 2017

[2] Md. TaslimArefin, Mohammad Hanif Ali, A.K.M. Fazlul Haque, A Comparative Analysis of ShortRange Wireless Protocols For Wireless Sensor Network, International Journal of Scientific & Engineering Research, Volume 8, Issue 4, April-2017.

[3] N. Mahalakshmi, E. Elavarasi, Design of Intelligent SMS Based Remote Metering System for AC Power Distribution to HT and EHT Consumers, International Journal of Computational Engineering Research, Vol. 2, Issue 3, pp. 901-911, Jun 2012.

[4] Md. Masudur Rahman; Noor-E-Jannat; Mohd. Ohidul Islam; Md. SerazusSalakin, Arduino and GSM Based Smart Energy Meter for Advanced Metering and Billing System, Int'l Conf. on Electrical Engineering and Information & Communication Technology (ICEEICT),21-23 May 2015.

[5] Malka Tarannu, Durga Sharma,Dr Dharmendra Singh, Electricity Theft in India: Its Measure and Solution, International Journal of Advance Research, Ideas and Innovations in Technology, (Volume3,Issue5)

[6] Md. Masudur Rahman; Noor-E-Jannat; Mohd. Ohidul Islam; Md. SerazusSalakin, Arduino and GSM Based Smart Energy Meter for Advanced Metering and Billing System, Int'l Conf. on Electrical Engineering and Information & Communication Technology (ICEEICT),21-23 May 2015.

[7] Gower, A.H., Non-technical losses: how much are you losing?, Paper presented at the Fourth Annual South Africa Revenue Protection Association Conference, 2000

[8] Jenita Ann Mathews,Jily Varghese, Jisha Raju, Lidiya Daley, Beena A.O, Intelligent Energy Meter With Power Theft Detection, India Technical Research Organisatio

[9] Naveenkumar, Jagadeesh S K, Smart Energy Meter, International Journal of Technical Research and Applications,4, Issue 3 (May-June, 2016), PP. 126-129

[10] Pandurang G.Kate, Jitendra R.Rana, ZigBee Based Monitoring Theft Detection and Automatic Electricity Meter Reading, International Conference on Energy Systems and Applications (ICESA 2015), Nov, 2015

[11] Viredra Pandey, Simrat Singh Gill, “Wireless Electricity Theft Detection System using Zigbee Technology” IJRITCC,Volume 1,Isuue

[12] R.B Hiware, P.Bhaskar, UttamBombale, Nilesh Kumar, “Advance Low Cost Electricity Billing System using GSM” Hiware et al.,International Journal of Advanced Engineering Technology EISSN 0976-3945. [12] Jayaprakash J.,Iot based Energy Meter,IJARTET, Vol.5, Issue 6,June 2018