iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** III **Month of publication:** March 2019

DOI: http://doi.org/10.22214/ijraset.2019.3353

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 7 Issue III, Mar 2019- Available at www.ijraset.com

Health Caring Chair

Mr C Babu[1], Karthika E[2], Karthikai Chelvan E[3], Kausalya R[4], Kaushalya M[5]
[1]*Associate Professor,* [2, 3, 4, 5]*Students of Electronics and Telecommunication Department, Sri Shakthi Institute of Engineering and Technology, India*

Abstract: ***One of the most frequently used product in the work environment and one with the greatest impact on long term health is the standard office chair. Health caring chairs can measure the length of time that employee sits, and indicate when they should get-up to walk. This is also used in monitoring the heart rate of the employee regularly. Long hours of uninterrupted sitting will result in a variety of health complications.This growing concern has pushed several company officers to select standing worktable or create changes to the worker operating schedule by organising engineering science sessions, stressing the importance of right sitting posture and regular exercise. These problems can be overcome by continuous monitoring of employee physical activity and by requesting them to walk for some time and this can be done using a health caring chair.***
Keywords: Arduino, Bluetooth, Smart Chair, Health

I. INTRODUCTION

In general, people spend a lot of time sitting when working in the office, in a meeting, in the theatre, when having a meal when playing games or watching TV. In it has been shown that on average, people with sedentary jobs sit 9.95 hours at working days and 8.07 hours when not working. From the higher than, instrumented chairs could appear like a lucid approach to activity recognition. On the opposite hand, there's the question that what proportion info will be extracted from chair-mounted sensors. Per definition, once sitting, individuals tend to have interaction in activities that involve very little motion of the body trunk and largely determined by hand actions and psychological feature processes. At a similar time, the body trunk is the main physical interface between the chair and the user, and thus the main potential source of information. As a consequence, the overwhelming majority of labour on chair based mostly activity watching has centered on posture analysis and therefore the activity of physiological parameters that may be extracted from the trunk by electrodes integrated within the seat (see connected work section). Such work has so far relied on sensors integrated into the seat itself or the backrest (often using smart textiles), which implies significant effort in terms of unobtrusive instrumentation in everyday environments. This growing concern has pushed several company offices to prefer a standing work table or build changes to the worker operating schedule by engineering sessions, stressing the importance of right sitting posture and regular exercise. These problems can be overcome by continuous monitoring of employee's physical activity and making them walk for some time at frequent intervals, which can be accomplished by health.

A. Hardware Description

1) *Arduino Uno:* Arduino Uno may be a microcontroller board supported the ATmega328P (It has fourteen digital input/output pins of that six may be used as PWM outputs), six analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button Programs can be loaded on to it from the easy-to-use Arduino computer program . The Arduino has an in-depth support community, which makes it a very easy way to get started working with embedded electronics. The R3 is the third, and latest, revision of the Arduino Uno. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to urge started.
2) *Load Sensor:* A Load sensing element is outlined as an electrical device that converts Associate in Nursing input mechanical force into Associate in Nursing electrical signal. Load Sensors also are unremarkably called Load Transducers or Load Cells. Mostly used load cell in an industry is Strain gauge load cell.Strain gauge load cells area unit the foremost common in business. The modification in resistance of the gauge provides Associate in nursing electrical price modification that's a label to the load placed on the load cell.
3) *HC 05 Bluetooth:* HC-05 could be a Bluetooth module that is intended for wireless communication. This module can be used in a master or slave configuration. It is used for many applications like a wireless headset, game controllers, wireless mouse, wireless keyboard and many more consumer applications. It has range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions. It is IEEE 802.15.1 standardized protocol, through which one can build wireless Personal Area Network (PAN). It uses frequency-hopping spread spectrum (FHSS) radio technology to send data over the air.

B. Figures and Tables

Recently, various systems and applications utilizing IoT technology have been developed to help people in addressing issues that occur in our everyday life. The health caring chair system is based on a network of connected sensors embedded on the physical chairs to collect information, which is governed by the functionality of Bluetooth. In this project, we implemented the prototype experimented. Later; we will extend it further to a connected smart chair system. Most people today spend more than half of the day on chairs for various purposes such as studying, driving, or working. For this reason, modern people are afflicted with waist disease such as the lumbar disc, hip twisting and scoliosis, which rarely occurred in the past. For this reason, many hospitals which specialize in treating spines have been established nowadays. The system architecture is drawn in Fig. 1.1

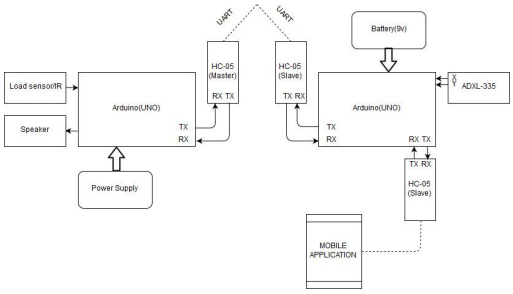


Fig. 1.1 System Architecture

II. RESULTS AND DISCUSSION

The open source Arduino Software (IDE) makes it easy to write code and upload it to the board. This Software can be used with any Arduino board. The Arduino integrated development environment (IDE) is a cross-platform application (for Windows, Mac OS, Linux) that is written in the programming language Java. It is used to write and upload programs to the Arduino board.

The load cell is fabricated and the program is uploaded in Arduino board, it detects the presence of a load. The timer module is included in the program and it monitors the continuous presence of load for a long period of time. If the flag is set to 1 (i.e. load is present for a long period of time) it indicates the memory card module to play an audio file which insists user walk. The walking distance is monitored by an accelerometer and the message is sent to other Arduino using Bluetooth module. A snapshot of walking distance is shown in Fig 1.2

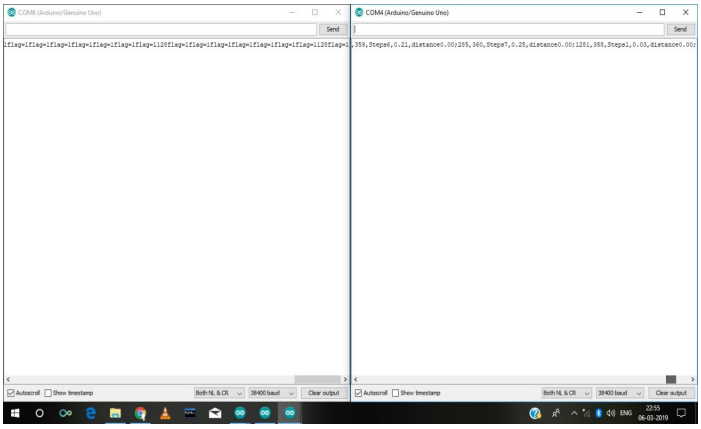


Fig 1.2 Snapshot

III. CONCLUSIONS

We have done the prototype for the health caring chair; it overcomes several problems like lifestyle sedentary diseases and many other posture problems due to prolonged sitting. This can be used even for children's chair where they sit for a prolonged time without playing so the degeneration of neurons can be reduced at the earliest. It will be a necessary one in the smart office. It makes persons mentally and physically healthy because sitting for a long period of time is new smoking according to a recent survey. This smart chair would be a very efficient one in case if an office decided to transform their office into a smart office. Some of the advantages of using Health Caring Chair are enlisted below,

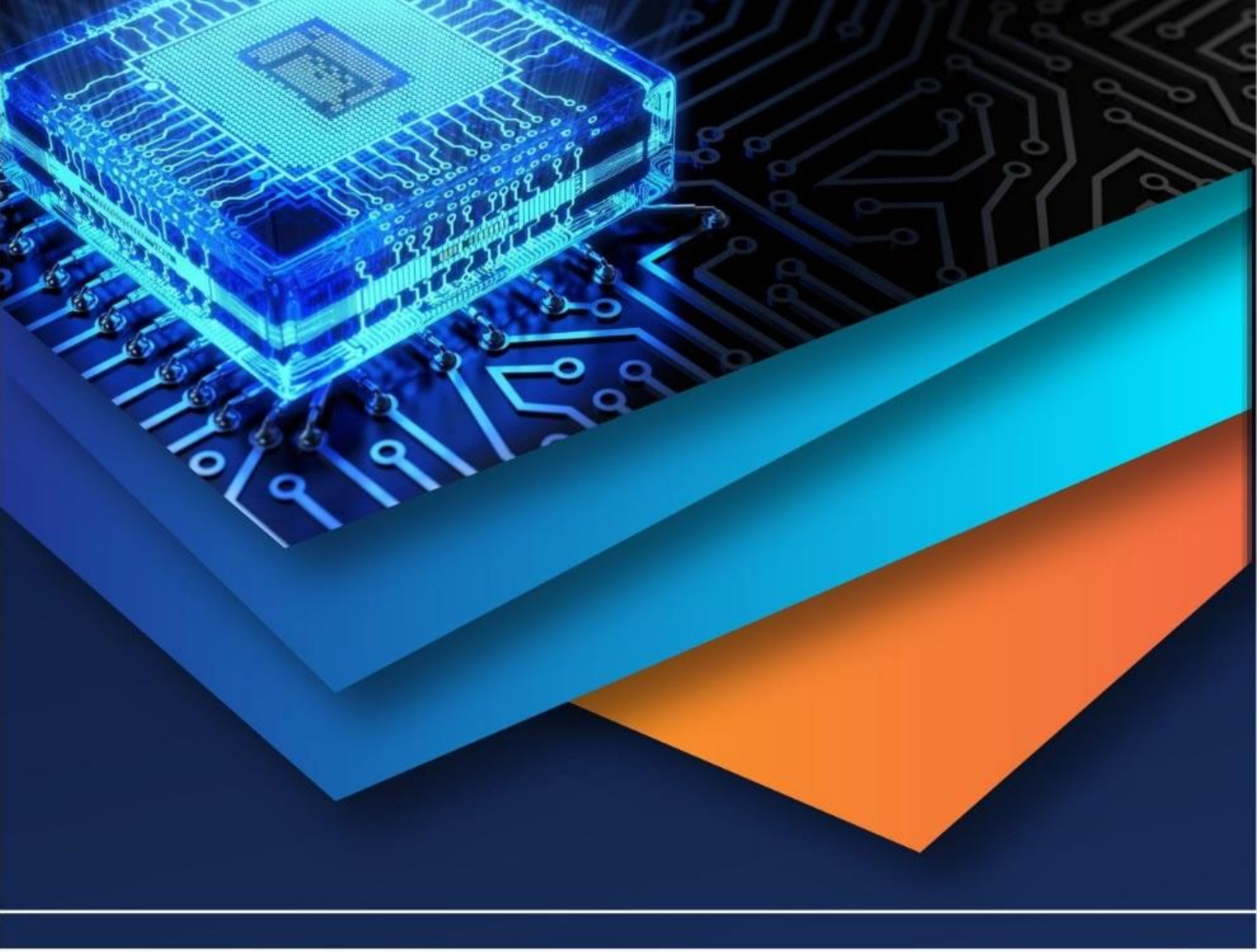
A. Low power consumption
B. Continuously monitor the health of an employee.
C. High speed
D. Reduce stress and anxiety.

IV. FUTURE WORK

The future enhancement that can be done here is that it can be made as a product in the chair. Its functionality can also be increased like maintaining posture, measuring weight changes, temperature. This adds up to the value and can be made as a perfect product.

REFERENCES

[1] Mingyu Park, Younghoon Song, Jaewon Lee, Jeongyeup Paek, “Design and Implementation of a Smart chair system for IOT”, IEEE,2016.
[2] G.R.D Ganesh, K.Jaidugamohan, Vakada Srinu, "Design of a low-cost smart chair for telemedicine and IOT based health monitoring: An open source technology to facilitate better healthcare, IEEE,2016.
[3] Byeong-Ju Kim, Yun_Hong Noh, Do-Un Jeong, “Implementation of the smart chair system for Multi-functional Unconstrained Healthcare Monitoring, "IEEE, 2015.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY