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e-ISSN: 2320-9801 | p-ISSN: 2320-9798



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

**Volume 9, Issue 7, July 2021**

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 7.542**



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# Design & Implementation of Bio-Feedback Handglove System

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**ABSTRACT:** Previously, we have been keeping up with persistence during the time spent recuperating and getting treatment aftereffects of our arm breaks or any muscle bothers after a mishap. Bio-Feedback treatment is an instrument-based learning measure that depends on "operant molding" methods.

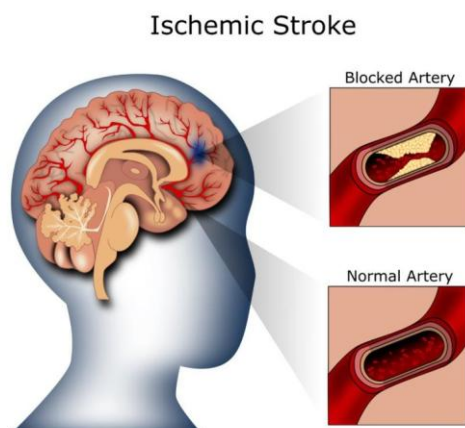
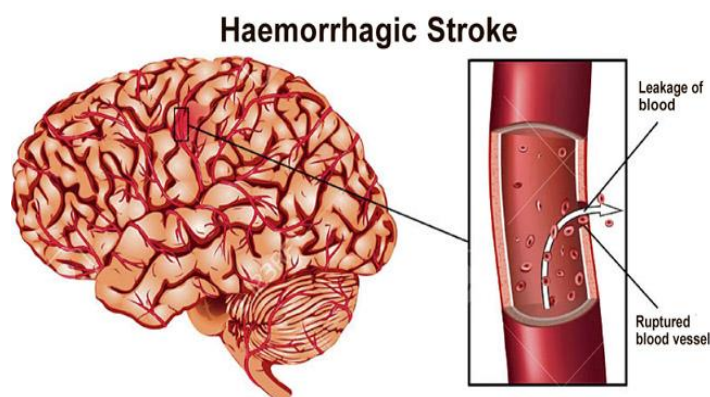
PC, cell phones, and the recently arising wearable advancements inspire scientists to establish new conditions. Shrewd glasses, which are one of the current wearable advances, are among the creating innovations. Studies have been led for the convenience and usefulness of this innovation, which is utilized to detect the articles, in training just as numerous different regions. These days various strategies are accessible for the genuinely crippled like hard of hearing and unable to speak individuals. In any case, till now the successful answer for the issue isn't yet to execute totally. By looking at all these current strategies here, we are proposing another strategy "Hand Glove" by utilizing Arduino with Health Parameters observing.

**KEYWORDS:** Biofeedback, Arduino UNO, MEMS Sensor, Heartbeat Sensor, Temperature sensor, Arduino microcontroller, Rehabilitation.

## I. INTRODUCTION

Biofeedback can be utilized for the retraining of the arm and hand as an approach to restore after a stroke. Following a stroke, the focal pathways that are answerable for the administration of ordinary muscle tone and working can be upset or harmed. Notwithstanding the accessibility of a few stroke restoration gadgets, there is a requirement for a framework that is complete, smaller, and advantageous. The settings in the current recovery gadgets are that they are mind-boggling, massive in structure, and are costly. To conquer these impediments, an inventive electric glove framework has been prototyped to help finger debilitation in post-stroke patients. The outcomes acquired from this glove can be dissected utilizing an information scale. This clear framework can be utilized by physiotherapists and specialists to get subjective outcomes. The point here is to give a great many individuals experiencing a stroke, a restoration framework that isn't just viable yet in addition moderate simultaneously.

Stroke is the second most driving reason for death on the planet, representing roughly 12% of all passing's. It is the most well-known reason for long-haul handicap with tremendous financial weight. An ailment wherein the bloodstream to the mind is limited outcomes in the passing of synapses. A stroke-influenced individual may lose the usefulness of one side of the body, lose bladder control, and may encounter pneumonia. The various sorts of strokes that happen in the mind are as per the following: **Ischemic Stroke** and **Haemorrhagic stroke**.

**Figure 1: Ischemic Stroke****Figure 2: Haemorrhagic Stroke**

The accompanying pictures show us the manner in which the stroke happens. Issues that happen after stroke are shortcoming, loss of motion, and issues with equilibrium or coordination. The inability experienced by a stroke-influenced individual relies upon the size of the mental injury and the specific cerebrum circuits that are harmed. Stroke the executive's offices are important to forestall stroke and assist individuals with recuperating a stroke. The technique by which an individual who has experienced a stroke can return back to typical life by relearning certain abilities and going through medicines, for example, physiotherapy is called stroke-recovery. To help in restoration a reduced, extensive, and moderate recovery glove is prototyped. It is a creative electrically fueled glove framework that assists patients with engine disabilities on their hindered muscles after a stroke. This biofeedback glove utilizes an activation system to recognize muscle action on the upper-lower arm. To distinguish the client's endeavors during hand developments, the accelerometer is utilized. This information gained is given to the clinical establishment for better guidelines of restoration practice for the patient's muscles for quicker and most effective recuperation. Post-stroke recovery checking gives us sufficient data through which treatment can be redone according to the patient's condition. Recovery checking frameworks that are as of now being utilized are intricate, convoluted, and weighty. Recovery observing frameworks that are at present being utilized are perplexing, confounded, and substantial. To beat these constraints, the glove is planned. The principal objective of the stroke recovery gadget is to help a huge number of poststroke patients by giving information to investigating the conditions in the arm muscles and fingers. The objective is to make it reasonable and straightforward.

## II. RELATED WORK

There have been a few bits of exploration in the field of clinical science to foster a framework that lessens the reliance on the overseer and furthermore self-checking.

- (1) F. Axisa proposed a framework called Wrist walking observing framework and smart glove for constant passionate, sensorial and physiological examination (2005)
- (2) Steven L Wolf proposed the headways in Bio-Feedback Technology for Neuromotor Rehabilitation (2006)
- (3) Klara Fiedorova proposed a model that breaks down the Upper Limb Movement for Biofeedback in Rehabilitation (2019)
- (4) LuayFraiwanfostered a smart glove for stroke-driven furthest point paresis (2020).

In the previous study, it has been noticed that up to this point the advancement of the work has been utilized distinctly with Flex sensors which are high in cost and have a further couple of disadvantages.

## III. PROPOSED SYSTEM

In this project, we are utilizing a heartbeat sensor for observing heartbeat, MEMS for hand development recognition, and a temperature sensor for internal heat level, and every one of the qualities is shown in LCD. In the event that any qualities are going past the limit esteems, a bell ready will be given.

IV. METHODOLOGY

The procedure shows the orderly method to manage the job. It is the standard cycle of depicting an interaction, how it is done in the least difficult way. The plan comprises of the utilization of the logical guideline, specialized data, and creative mind for the advancement of Bio-feedback Hand glove to play out a particular capacity.

V. BLOCK DIAGRAM

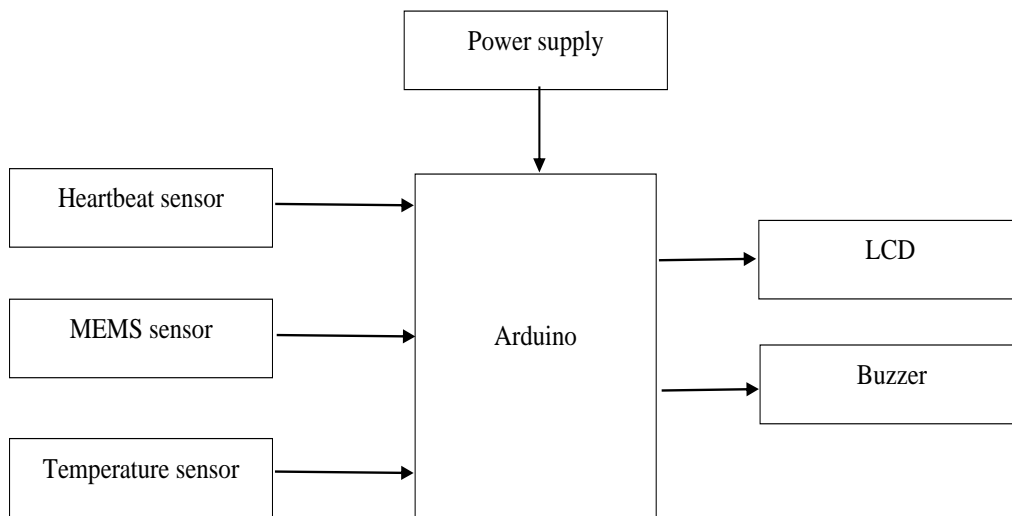


Figure 3: Block diagram of Bio-feedback Hand glove

VI. FLOWCHART

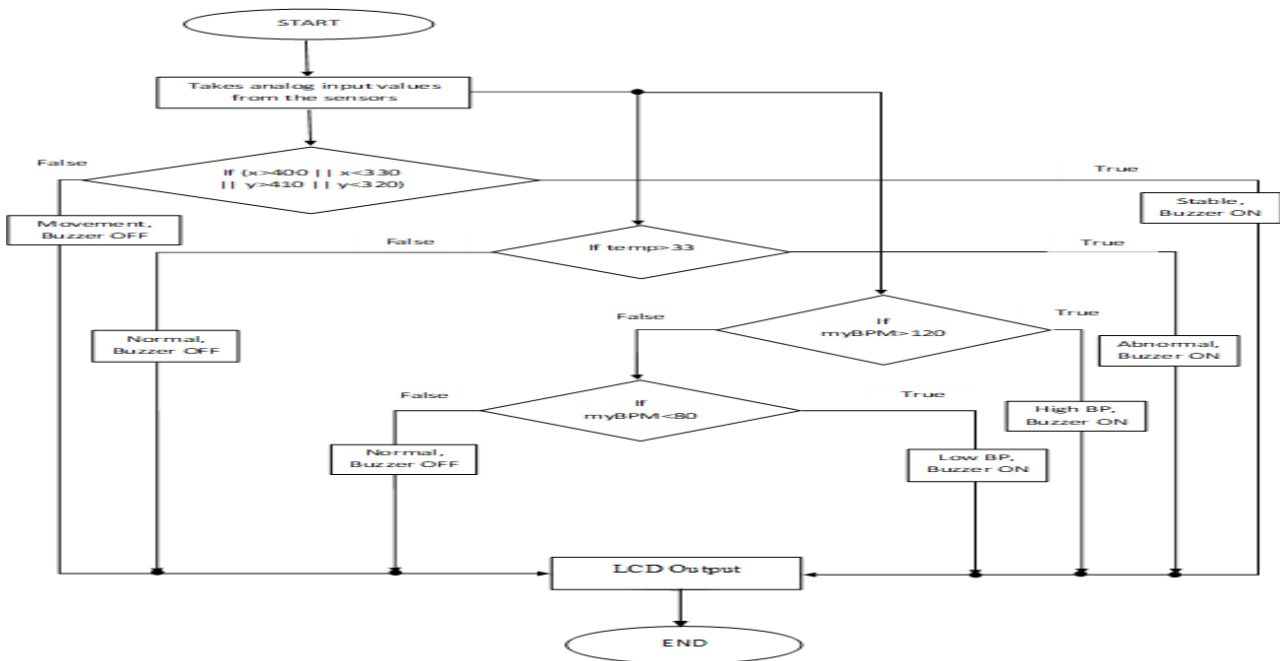


Figure 4: Flowchart of working process



## VII. RESULTS

The prototype of the system is given below:



Output of MEMS Sensor:

Output of the Temperature sensor:



Output of the Pulse sensor:



Output of the Pulse sensor:



It displays stable if the condition of these parameters is normal.



For every abnormal output, a buzzer is fixed to the system to give an alert.

#### VIII. CONCLUSION AND FUTURE WORK

The interest for well-being observing framework that helps clients working in antagonistic conditions screen their vitals is on the ascent. well-being checking is a flourishing industry and may take over numerous regular operations to analyze and distinguish an unexpected problem of a person. These gloves are intended to be utilized in outrageous climate conditions likewise giving exact yields immediately. In the future, we can interface speaker to the module for daze individuals, use E-Textile material for hand gloves, and furthermore use nano electronic materials to save space.

#### REFERENCES

1. Mizuchi, Y., Kawai, H., Hagiwara, Y., Imamura, H., & Choi, Y. (2010, October). Estimation for a hand position and orientation robust to motion of fingers using a web camera. In Control Automation and Systems (ICCAS), 2010 International Conference on (pp. 187-190), IEEE.
2. Bäckman, M., and Tenfält, A.(2015). Exploring the opportunities of wearable technology within siemens ag. Master of Science Thesis Department of Technology Management and Economics Division of Innovation Engineering and Management Chalmers University of Technology Göteborg, Sverige.
3. K. Li, I.-M. Chen, S. H. Yeo, & C. K. Lim (2011). Development of finger-motion capturing device based on optical linear encoder. Journal of rehabilitation research and development, 48(1), 69.
4. Mitobe, K., Kaiga, T., Yukawa, T., Miura, T., Tamamoto, H., Rodgers, A., & Yoshimura, N. (2006, July). Development of a motion capture system for a hand using a magnetic three-dimensional position sensor. In SIGGRAPH Research Posters (p. 102).
5. Nishiyama, M., and Watanabe, K. (2009). Wearable sensing glove with embedded hetero-core fiber-optic nerves for unconstrained hand motion capture. IEEE Transactions on Instrumentation and Measurement, 58(12), 3995-4000.





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