



# LIFE SAVER SMART GLOVES FOR LINE MEN

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**Abstract:** Electrocutation is an unfortunate mishap prevailing in most of the countries across the world for which the electricians become a dominant prey due to their ignorance in utilizing the safety wearable's especially gloves. The wearables are usually insulated and tested apart under various testing conditions, thus electrician gloves are designed to withstand 11KV of voltage. These gloves often considered optional by electricians as there's no mandatory conventions imposed. This lethargic attitude poses the way for fatal electrocutation. This paper focuses on building a device which monitors the health of the electrician and which composes of measuring instruments which measures the voltage, ampere, inductance, capacitance, resistance, rotation and connectivity test. The health monitoring system and the measuring instruments are integrated on the insulated electrical gloves. Besides, the gloves do calculate the working hours of the electrician once he wears it. By this, the gloves become mandatory for electricians who work on live-wire.

**Keywords:** Electrocutation, Health monitoring, Electrical gloves, Live wire

## I. INTRODUCTION

In India, fatality due to electrocutation is raised by 30 people per day. Among these, it's determined that about 5 people are electrician. The electrocutation happens when there's a lack of safety measures while working in high voltage lines. As per experts, in developing countries like India, there is less awareness on safety and electric equipment is often not used as per standards laid down. Besides, the need of user-friendly measuring instruments has high demand as the electricians working along overhead lines as difficulties as he has to carry a bunch of measuring instruments when poses risk remaining with these instruments at the same time. more over, these electricians sometimes work in remote isolated areas, in such cases if their health get affected or if it's fatal there arises the need of user-friendly device which could report the situation to others or emergency services. They get fainted due to minor accidents and these mishaps are sometimes reported after the electrician reaches his critical health limit. It might be quite challenging to design a system which ensures safety as well as user-friendly. A device which can monitor the health of the electrician as well as measure the electrical quantities is an undeniable need. The gloves besides monitoring the physical health a mental health monitoring system is also necessary. Thus, a wearable which must be designed for the end-users is paramount.

## II LITERATURE SURVEY

1]. Kowalski E. L. Robert, Tomioka J, Teixeira Junior J. A' Tosin J. C. 4, Clerise R.E, Otto Filho E, "Natural rubber Electrical Conduction under high and low electrical field", IEEE, 2019 This work shows the experimental results obtained from ageing at a temperature of 100 °C for 48, 70 and 312 h, although the application of AC electrical tension in samples and the measuring of current leakage are presented. The measurements in samples were carried out with samples prepared from the deformed commercial materials and respectively reformulated into thin films. The obtained results showed the mechanisms of conduction of samples in low and high electric fields. It was also identified an electric tension transition showing that in low fields it prevails the Ohm's law conduction, and in high electric fields it prevails the conduction of space charge limited current (SCLC). These results can support the natural rubber formulation process having as their main objective the reducing of the mechanisms that occur under high conduction current in high electric fields, which leads the material to a dielectric breakdown.

2]. Dhivya V., Anandakumar H, and Sivakumar M, “An effective group formation in the cloud based on Ring signature,” 2015 IEEE 9th International Conference on Intelligent Systems and Control (ISCO), Jan. 2015. This work focuses on multi owner group and the importance of multi owner group are jor down. In Multi owner group, the encryption overhead is reduced by using Ring signature and we prove Ring signature is more secure than Group signature and dynamic broadcast encryption techniques. In ring signature a particular user identity is taken and encrypted in such a way, the encryption techniques doesn't change and the user key is changed automatically, when a user leaves the group. The work that is been focused in this paper towards the group formation, to authenticate the user and validate their key using ring signature.

3]. Paúl Yanchapaxi, Christian Tipantuña, Xavier Calderón, “Wearable system for monitoring of human physical activities”, IEEE, 2019 This paper is focus on the progress of wearable technology in the area of human healthcare. It has been developed a small, low cost, low power consumption and open source wearable system that allows the monitoring of the human physical activities. One of the main reasons for developing this wearable system is to promote the sport activity and combat physical inactivity i.e. a sedentary lifestyle, which is one of the mains diseases nowadays, and it affects a large number of people around the world.

## 2.1 Outcome of Literature Survey

From literature survey the main objective is to reducing the mechanism that occur under high condition current in high electric fields, which leads the material to a dielectric breakdown. The paper focuses on the progress of wearable technology in the area of human healthcare. It has been developed a small, low cost, low power consumption and open source wearable system that allows the monitoring of the human physical activities. One of the main reasons for developing this wearable system is to promote the sport activity and combat physical inactivity i.e a sedentary lifestyle, which is one of the mains diseases nowadays, and it affects a large number of people around the world.

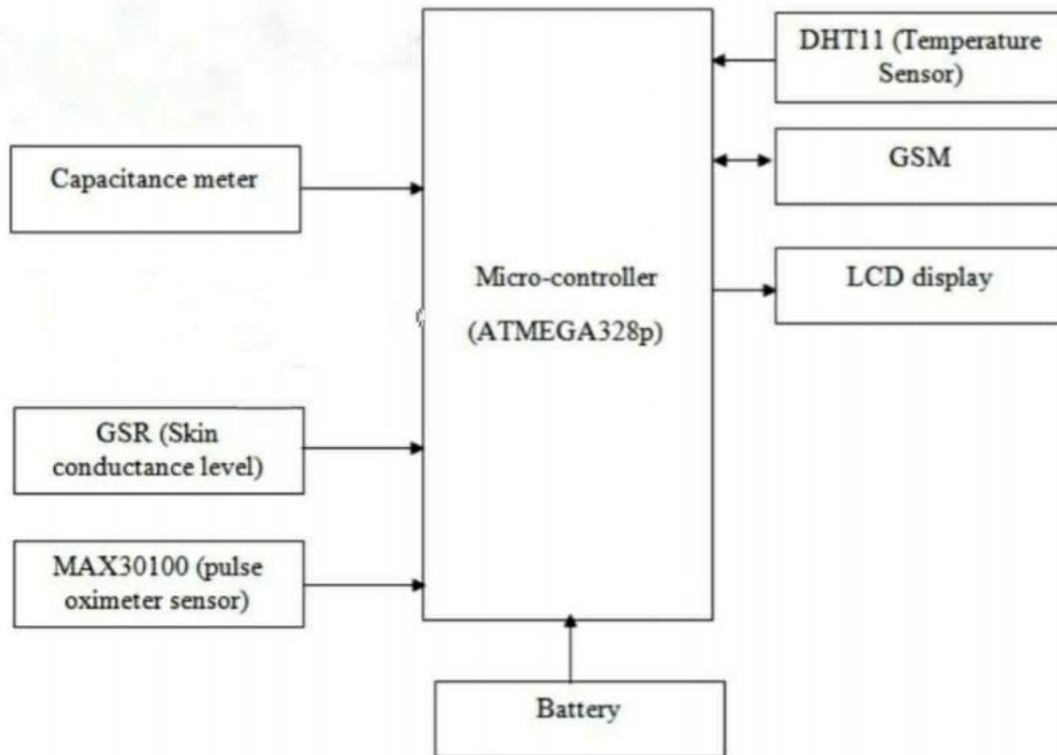
## III PROBLEM STATEMENT

- Electricity is hazardous an electric shock from a current as low as 35mA is sufficient to cause fibrillation of the heart in the vulnerable individuals.
- Understaffed, overworked, without safety gears and resulting in hundreds of deaths every year.
- A healthy individual is at risk of falling from a high structure due to loss of muscle control.
- Higher currents can cause respiratory failure and result in extensive and life threatening burns.
- The lack of any visible sign that a conductor is energized at high voltages, makes electricity a particular hazard.
- There are many electrical accidents happened and still happening due to lack of security provided to the linemen.

## IV OBJECTIVES

- The main objectives of the project are to save the life of line men from being electrocuted.
- To provide protection against live wire for line men for safer operation on power line..
- To measure the Electrical parameters such as voltage, capacitance etc.
- To monitor the health of the linemen and to check his health condition.
- To overcome problem faced by line men for smoother operation.

## V METHODOLOGY



**Fig:Block Diagram**

The Smart Electrician Gloves includes both multiple hardware and software linked with it. The glove pair has specific component on each glove. The components are integrated with the gloves. The left glove consists of the following hardware circuits such as, LC meter circuit and the following sensors temperature sensor (DHT11), Skin conductance level (GSR) sensor, pulse oxy-meter sensor (MAX30100) and GSM module. All these parameters re collectively displayed in the Liquid crystal display. The right glove consists of the following hardware circuits such as voltmeter, Ammeter, resistance meter, continuity tester and wireless testing circuits. The readings are collectively displayed in the seven-segment display

#### ADVANTAGES/DISADVANTAGES/APPLICATIONS

##### Advantages:

- The risks confronted by the electricians are succeeded by integrating the health monitoring system and as well as the measuring instrument.
- The proposed system thus facilitates user-friendly gloves which can thus protect electricians as well as support them at various circumstances.
- The micro-controller besides monitoring the health and measuring electrical parameters.
- The mental, physical health and their works can be thus monitored effectively.

##### Disadvantages:

- Complexity in working.

##### Applications:

- Used for line men for working on energized power lines.
- Efficient working of linemen can be done.
- Used for linemen for knowing their health condition.

#### VI CONCLUSION

The proposed model contains the merits that overcome the lethargic attitude towards safety conventions by integrating measuring equipment on that. Besides, the components are integrated and the counter counts the working hours. Thus, making the wearable mandatory while working on high tension wire. Thus, Smart electrician gloves could be the best product among all the products in electrician's tool-kit. If these additional circuits are integrated very minutely on top of the flexible gloves then the product would be a boon. The gloves can be employed for various workers working in construction projects by the employment of work specific

sensors and other components. Thus, the errors while working can be minimized effectively moreover the transparency in the calibration of an electrician can be accomplished so that their superior can note down all their measurements. So, Smart electrician gloves are one of the most needed devices now.

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