

Diabetic Foot Pressure Monitoring System

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Abstract— This paper presents patients with diabetes, suffering from peripheral neuropathy are at high risk of developing diabetic foot. The foot ulcerations caused mainly by high peak plantar pressures. In diabetic patients who had the diabetic for a long time, the nerves of foot get affected and cause various symptoms of nerve damage. In order to reduce and to avoid the foot ulcerations pre scanning of foot pressure was frequently measured by using FSR sensor. With the help of Arduino controller we can get the accurate output value.

Key words: Diabetic Foot Ulceration, Force Sensitive Resistor (FSR), Arduino controller

I. INTRODUCTION

Diabetes brings with it neurovascular complications, which results in development of increase in pressure among the foot region. Patients with diabetic poly neuropathy often lose pain and temperature sensations in their feet, resulting in inadequate pressure under their feet, during walking or standing.

Loss of anyone of these functions can be determine to the patient, and is often noticed in patients with diabetes [1]. foot ulceration is affecting 25% of patients with diabetes during life time and 85% proceeds to lower limb amputation [2]. Normally blood glucose levels are highly controlled by insulin, a hormone produced by the pancreas. Insulin regulates the blood glucose level [3]. Peripheral autonomic dysfunction may result through sweating reduction in abnormal skin conditions increasing the risk of FU [4]. Normalized peak pressure (NPP) and pressure contact ratio, PCR, which take it in to consideration the weight of the person. Walking velocity and magnitude and duration of the peak foot pressure acting in ten areas of the foot [5]. Foot orthosis it's used to alter foot bio mechanics and associated dysfunction [6]. Plantar foot pressure studied, in the patients with diabetics neuropathy indicated relationship between excessive pressure and ulceration [7].

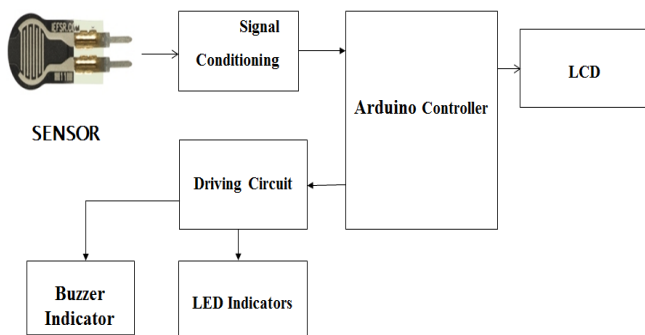


Fig. 1: Block Diagram of Foot Pressure Monitoring

This may cause injury in the feet. Painless trauma develops and results in ulceration. So prevention of diabetic foot ulcer is needed. A foot has five major functions. It is the basement for whole body, in this work we are using FSR sensor to detect the foot pressure according to the variations

in the pressure we can able to find the accurate location of the damage in the foot.

II. SYSTEM DESIGN

Power supplies that supplies electric energy to an electric load. The primary function of a power supply is to convert one form of electrical energy to another form of energy. In this it produces necessary power to the device 5V and 12V power supply. A force sensing resistor is a material whose resistance changes when a force or pressure is applied. They are also called as “Force Sensitive Resistor”. It is used to scan the foot pressure. Controller has inbuilt ADC, it converts the analog voltage produced from the sensor and displays in the display. Hence indicator was used to indicate the output and to detect the foot pressure value.

Signal conditioning means manipulating an analog signal in such a way that it meets the requirements of the next stage for further processing most common use is in Analog to Digital Converter (ADC).

A. FSR sensor (Force Sensing Resistor):

Force Sensing Resistors (FSR) is a polymer thick film device. It exhibits a decrease in resistance and increase in force applied to the particular surface area. The FSR sensor will vary its resistance value based on how much pressure is applied to sensing the particular area. When no pressure is applied to the force sensitive resistor (FSR) its resistance value will be greater than 1MΩ.

B. Buzzer Indicator:

Buzzer or Beeper is an Audio Signaling Device. It includes Alarm as well as Timer used for confirmation of user input to alert any critical situation arises in particular timing of kit.

III. RESULTS AND DISCUSSIONS

This system efficiently detects the Foot Pressure Monitoring by placing the Foot on the sketch of Cardboard.

The Diadetics patient can be easily identified by the reading displayed on the LCD.



Fig. 2: Output of Foot Pressure

IV. CONCLUSION

This device can be widely used for Athletics as well as sports person since handling this system is simple. The diabetes of the patient can be measured and then noted what the range they are suffering.

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