# Instrumentation Based Human Vital Parameter Foot Display

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***Abstract-*** *In daily life cycle, globally 42% of the disabled people keep an eye on their vital parameters such as blood pressure, temperature, pulse rate, blood glucose level, BMI, BMR, humidity etc. Among the 42% people, 25% of them are not felt comfortable to go to the hospital or clinics. So we strong-willed to design an assist device, for measuring most important vital parameters in the home itself with a single device. This model is fixed in a shoe for compactness and also can easily wear and measure their own vital parameters in a short duration of around two to three minutes, the design includes various and different types of sensors for measuring the mentioned vital parameters in an easy way. This prototype will help most of the old aged and disabled patients to visualise their condition of mending.*

## I. INTRODUCTION

In the day to day life people are facing various health issues because we are not able to maintain and measure our vital parameters regularly due to our work and also it takes maximum time to get results. For each parameter we need specific equipment and also it is costlier. So we decided to design an assist device from which we can able to measure more than five vital parameters like pressure, temperature, humidity, weight ,pulse rate, BMI etc. In our project we are going to measure these parameters from foot because in foot we can measure all this parameters. This model is fixed in a shoe for compactness and also we can easily wear and measure our own parameters. Instead of using several equipments we design a single device to measure the parameters and also it saves time.

## II. ANATOMY OF FOOT

The foot is a part of vertebrate anatomy which serves the purpose of supporting the animal's weight and allowing for locomotion on land. In humans, the foot is one of the most complex structures in the body. It is made up of over 100 moving parts – bones, muscles, tendons, and ligaments designed to allow the foot to balance the body's weight on just two legs and support such diverse actions as running, jumping, climbing, and walking. The foot contains 26 bones, 33 joints, and over 100 tendons, muscles, and ligaments. This may sound like overkill for a flat structure that supports your weight, but you may not realize how much work your foot does. The foot is responsible for balancing the body's weight on two legs – a feat which modern roboticists are still trying to replicate. This requires strong, subtle muscles which can keep the foot standing firm even as we move our body's weight around at different positions and angles. The phalanges, which are the bones in your toes. The metatarsals, which run through the flat part of your foot. The cuneiform bones, the navicularis, and the cuboid, all of which function to give your foot a solid yet somewhat flexible foundation. The calcaneus, which is the bone in your heel.The talus, which is the bone in your ankle. The talus connects to the tibia, which is the main bone in your lower leg. Ligaments are bands of very strong, flexible tissue that perform the important job of connecting bones together. Ligaments are very strong and difficult to injure, but ligament injuries can be serious when they do occur. This is because ligaments do not receive much blood flow like bones and muscles, so they are slow to repair themselves. Just as there are many bones and ligaments of the sole of the foot, there are also many muscles. These can be divided up into four major groups. The central muscles of the sole of the foot. The lateral muscles of the sole of the foot. The medial muscles of the sole of the foot. The muscles of the dorsum (top) of the foot. Tendons are thick bands of tissue that connect muscles to bones. By connecting our rigid bones to our powerful muscles, tendons allow us to move. Movement occurs when our muscles pull on our bones, relocating them. Normally, tendons in the foot pull the bones of the foot in toward each other, resulting in distinctive arches between the heel and toes, and between the inner and outer toes. This arch is important for ensuring that weight is properly distributed among the strongest muscles of the leg and foot, and to ensure we can shift our weight as needed to keep our balance or move quickly. The internal parts of the foot are not the only important parts! The skin on the bottom of our feet protects our muscles, bones, tendons and ligaments from injury. It also prevents infection. Toenails protect the top of our toes, which, as we all know, can sometimes be vulnerable to being stubbed, stepped on, or having things dropped on them.

## III. METHODOLOGY

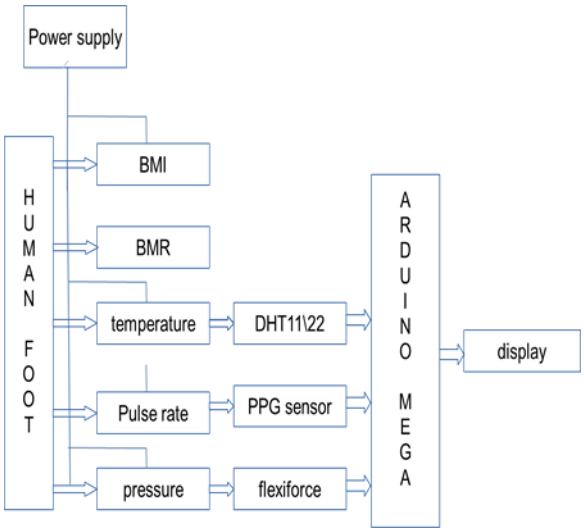


Figure: block diagram

Main method of our project is providing all the sensors interfacing in a single circuit .and display parameters in LCD using arduino programming. The sensors placed in the plantar pressure of the shoe that measure pressure ,temperature and humidity.DHT11 is a basic low cost digital temperature and humidity sensor .its fairly simple to use .features:low power consumption and extra component not needed. flexiforce sensors measure force from an applied load ,it can be measured by contact or touch..MAX30100 sensor is placed on ankle to detect pulse rate. The MAX30100 is an integrated pulse oximeter and heart rate monitor sensor solution. It combine two LED ,photodiode, optimized optics, low noise analog signal dispensation to detect pulse oximetry and heart rate signals. the feature of sensor is fast data output capability and high SNR provides robust motion artefact resilience

## IV. CONCLUSION

A single device has been developed to measure various vital parameter from foot using different types of sensors. future implementation of this project with weight and height parameter detection unless given by the user.BMI and BMR also be calculated by using this parameters.

## REFERENCES

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