

Team Name : _____

	Name	Branch and Semester	Contact Number	Email- ID
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Member 2				
Transaction ID (anju.marina.loba@oksbi)				

Note:

1. One can participate either as a part of a team or an individual basis. Switching teams is not allowed.
2. The uploaded ideas will be screened to go to the second round.
3. Judging : competition entries shall be judged, or winners selected based on the following criteria
 - Is the problem worth solving
 - How innovative or novel is the idea
 - Scientific accuracy
 - Social impact
 - Scalability
4. Decisions of IIC JSSSTU in respect of all matters to do with the competition will be final and no correspondence will be entertained.
5. In second round, the selected teams will have to present their idea in front of the jury panel.
6. Payment of INR 50 should be made to the UPI ID anju.marina.loba@oksbi and submit the transaction ID above.
7. Idea should be submitted in **.pdf** format.

Abstract: (not more than 150 words)

In those days, the blood glucose monitoring (BGM) techniques are invasive which require a blood sample of the diabetic patient that creates the risk of infection. But it is essential to avoid complications arising due to abnormal blood glucose levels in diabetic patients. This paved the proposed system to develop a non invasive monitoring technique. In this paper, the blood glucose level is non invasively measured by passing the suitable wavelength of red laser light through human finger. The 650nm wavelength of red laser is passed to the human finger which analyze the transmitted and absorbed blood samples to determine the glucose level (mg/lit). In this proposed method, the mathematical equation is derived to calculate the glucose level from the obtained voltage level. The corresponding values are investigated to determine the glucose level in blood. The

hardware implementation of this blood glucose monitoring device is designed and the glucose level is calculated by deriving the mathematical equations

Introduction (not more than 200 words)

Glucometer is working on the principle of electrochemical detection. The major drawback associated with this kind of disease is blood dependency, which makes it an invasive approach and also increases the risk of infection for the patient. In order to reduce the discomfort to the patient various methods on non invasive approach is used such as reverse iontophoresis, bioimpedance spectroscopy, absorption spectroscopy, fluorescence spectroscopy, electromagnetic sensing, polarimetry, raman spectroscopy and thermal emission spectroscopy to measure blood glucose. Increase in signal to noise ratio is the major concern for all non-invasive monitoring.

Motivation (not more than 100 words)

Diabetes is a metabolic disorder that threatens human at every age. It occurs not only among adults and elderly, but also among children and infants. The most common and simple measurement techniques used are invasive or minimally invasive techniques. These techniques have high accuracy measurement but are painful and has a high risk of infections such as thrombosis. Non-invasive techniques has are proposed as an alternative for pain free glucose measurements. But this process is computationally complex and requires more number of data samples.

Methodology (block diagram, related figures etc)

Glucose molecules have the ability to vary the refractive angle of light to an extent proportional to its concentration, and the overall refractive index of a given media. Refraction based estimation is based on the principle of Snell's law and the magnitude of each parameter is related to the concentration of glucose in the aqueous solution. According to Snell's law, the refractive angle is inversely proportional to the concentration of glucose in aqueous sample. The light ray (ab) in Fig. 2 tends to incline towards the normal ac and decreases the refractive angle (θ_2) as the glucose concentration increases hence more photons strike the photo-transistor.

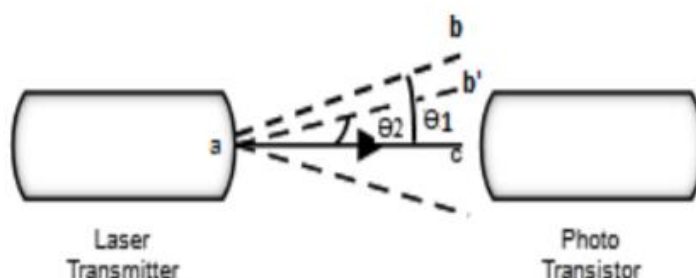
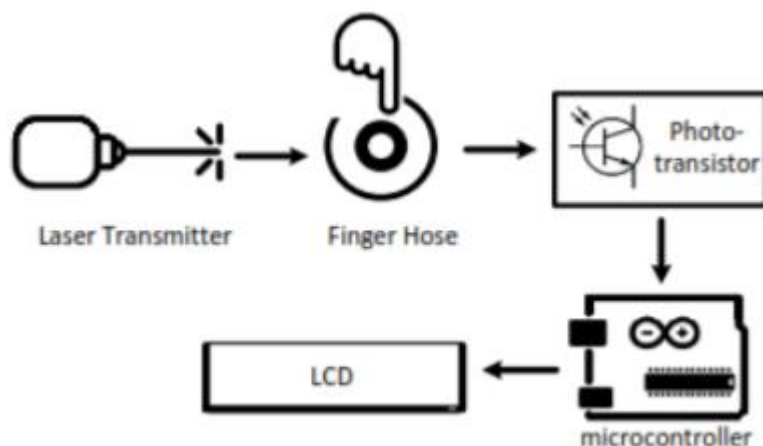


Fig -2: Refractive angle decreases with the increase in glucose concentration

In this proposed work, blood glucose level is measured using the non invasive technique, this can be done by the transmittance and absorbance of the red laser light. That is, the laser light is passed to the finger end and it gets reflected. The reflected light wave is emitted on the photo transistor and it results in voltage output. The outcome voltage value depends on the intensity of the blood.



Social Impact

Diabetes Mellitus is one of the common life threatening diseases in the world. Diabetes in general is known to increase blood glucose concentration which further introduces variations in the individual's metabolic pathways. The change in metabolism affects directly or indirectly the electrochemistry of various body fluids such as saliva, urine and tears. According to the recent report by Indian Diabetic Federation, 382 million people were found to be diabetic in the year 2013. Malaysia is ranked 10th in the world with the highest number of population with diabetes (World Health Organization, (WHO), 2013). The main cause of diabetes mellitus is still unrevealed, but it is closely related to body weight, gender, diet, genetic and physical activities. The effects of diabetes can only be seen between six (6) to twelve (12) months after having continuous high level of glucose in blood, which can further lead to other major health problems such as kidney failure, heart disease, blindness, stroke and neuropathy.

If this goal can achieved by just scanning finger tip then the user can avoid being worried about his blood sugar levels anytime.

Market Survey

Talking about the market survey the if the idea is made into a successful product then it will surely will have a high demand, also we can think of reducing the overall cost of the product to come within 1000 Rs.

