SMART GLUCOSE MONITORING SYSTEM

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Abstract—An intriguing idea that may help diabetes patients live better lives is the non-invasive approach has mentioned for detecting glucose levels using near-infrared (NIR) light. This treatment can lessen pain and discomfort by doing away with the necessity for repeated finger pricks, as well as the risk of infection that comes with invasive procedures. Using variations in the intensity of NIR light transmitted through the finger to measure glucose levels is a well-established technique in non-invasive glucose monitoring. This method is based on the fact that glucose absorbs NIR light, causing a decrease in the intensity of the light detected by the photodetector. The measurement is typically performed by placing a finger over the NIR light source and detector, and the glucose level is calculated from the change in the detected light intensity.

The proposed glucose monitoring system based on this method could be a valuable tool in healthcare for diabetic patients. The LCD display can show the glucose level to the patient, allowing them to take proactive measures to manage their condition.

Overall, non-invasive methods for glucose monitoring are an important area of research, with the potential to significantly improve the quality of life for diabetic patients.

Keywords- glucose sensor, non-invasive, glucose monitoring system, health care.

I. INTRODUCTION

Measurement of glucose concentration in human blood is an essential requirement for the medical treatment of any person by a physician. The existing measurement techniques may be of three types namely, invasive, minimally invasive, and non-invasive. The conventional invasive techniques for blood glucose monitoring, such as drawing blood from a vein, can be painful and inconvenient for patients. Minimally invasive techniques, such as using a portable glucometer to measure glucose levels from a drop of blood obtained through a finger prick, are less painful but still can cause discomfort.

Non-invasive techniques for blood glucose monitoring are becoming increasingly popular because they offer a painless and convenient way to measure glucose levels. Some examples of non-invasive techniques include using infrared spectroscopy, optical coherence tomography, and electrochemical sensors.

Intelligent healthcare has the vital goal of enhancing patients' quality of life, and non-invasive blood glucose monitoring can help in reaching this goal. These methods can assist diabetic patients in simply and often checking their blood glucose levels, which can aid with better disease control and better health outcomes.

The significance of daily web-based health services is continuously increasing, particularly in managing chronic illnesses such as cardiovascular and diabetes-related diseases, which significantly affect people's well-being.

Fluctuations in blood glucose levels are the primary cause of diabetes and maintaining it within a specific range is crucial. Individuals with abnormal glucose levels require close monitoring and intensive care to prevent deterioration.

II. PRINCIPLE OF BLOOD GLUCOSE MEASUREMENT ARE AS FOLLOWS:

A light ray is absorbed and scattered by biological tissues as it travels through them. The mismatch between the refraction index of extracellular fluid and the cell membranes causes light scattering in biological tissues. The variation in blood glucose levels has an impact on how much light is dispersed by the tissue. The Beer-Lambert Law, which states that the absorbance of light through any solution is inversely proportional to the solution's concentration and the length of the light ray's journey, is crucial in the measurement of absorbance.

The major building blocks of this project are:
• Power supply/Adapter.
• Arduino UNO SMD R3.
• Non-invasive glucose concentration measurement circuit.
• Photo diode Sensor
• LCD display.

Arduino SMD (Surface Mount Device) is a type of Arduino board that uses surface mount technology to mount components directly onto the surface of the board. SMD technology is different from traditional through-hole technology, in which components are mounted by inserting their leads through holes in the board and soldering them on the other side.
Arduino SMD boards are smaller and more compact than traditional through-hole Arduino boards, and they are often used in applications where space is limited. They are also more resistant to shock and vibration, making them suitable for use in portable devices and other applications that require durability.

Arduino SMD boards can be programmed using the same Arduino IDE and programming language as traditional through-hole boards. However, they may require different components and tools for assembly and repair, as the small size and tight spacing of SMD components can make them more difficult to work with.

III. PROPOSED SYSTEM

It is a promising system for monitoring diabetic patients. Remote monitoring of diabetic patients can help doctors to detect any irregularities in glucose levels and provide timely interventions, such as adjusting medication doses or suggesting lifestyle changes. This can lead to better disease management, improved health outcomes, and a higher quality of life for patients.

Automatically storing data in a database can help in building a valuable resource for future analysis, such as identifying trends and patterns in glucose levels and developing more personalised treatment plans.

Overall, this technology has the potential to improve the way diabetic patients are monitored and treated, providing a more patient-centric approach to healthcare.

IV. RESULTS

Please fill in this form to create an account.

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<tbody>
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<td>Password</td>
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<tr>
<td>Repeat Password</td>
<td></td>
</tr>
<tr>
<td>Enter Your Age</td>
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Registration of Patient

Glucose Value Showed on LCD display
Enter The Previous Sugar Value
-124

Enter The Current Sugar Value
-120

<table>
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<th>Current Sugar Value</th>
<th>Previous Sugar Value</th>
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</thead>
<tbody>
<tr>
<td>63</td>
<td>abhishek yadav</td>
<td>120</td>
<td>124</td>
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</table>

![Graph showing Current Value V/s Previous Value](image)

V. CONCLUSION

- This device, which combines both hardware and software elements, successfully monitors blood sugar levels.
- The primary function of this system is to instantly report blood glucose levels, including whether they are dropping or rising.
- The system delivers a precise result. Also updated are the patient's records.

VI. FUTURE SCOPE

- A crucial component of managing diabetes is routine glucose testing because this is the only way to keep blood sugar levels in the euglycemic zone.
- In terms of accuracy, affordability, convenience, and software-based data analysis and management, blood glucose meters have already advanced to a significant level. With the aid of the internet, patients can reach doctors with ease

REFERENCES: