

COMPARATIVE STUDY ON THE DIFFERENT RANGE OF NIR SENSOR
MEASUREMENT FOR GLUCOSE CONCENTRATION

MUHAMMAD HANIS BIN AZMI ALI

This Report Is Submitted In Partial Fulfillment Of Requirement For The Bachelor
Degree Of Electronic Engineering (Wireless Communication)

Fakulti Kejuruteraan Elektronik dan Kejuruteraan Komputer
Universiti Teknikal Malaysia Melaka

June 2016



UNIVERSITI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN
KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : .Comparative study on the difference range of NIR sensor
 measurement
 for glucose concentration

Sesi Pengajian :

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Signature :

Supervisor's Name : DR. WIRA HIDAYAT BIN MOHD SAAD

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ABSTRACT

Diabetes is known as one of the life threatening diseases in the world that occurs not only among the adults and elderly, but also among infants and children. Blood glucose measurements are essential for diabetes patients to determine their insulin dose intake and continuous monitoring is vital to ensure that glucose level is always within the normal range. The commonly used methods to measure glucose level in blood are invasive or minimally invasive which are high in accuracy but are usually painful and has higher risk on infections. As an alternative, non-invasive technique are introduced to develop a pain free measuring method. In this project, a study was conducted to determine which near infrared sensors are going to be the best sensor in detecting the glucose concentration. The three different wavelength of near infrared sensor are used in during this project. Several experiments were conducted to find the relationship between the output voltages and glucose concentration. Results of the experiments proved that the linear relationship between output voltages and glucose concentration is significant.

ABSTRAK

Diabetes dikenali sebagai salah satu daripada penyakit berbahaya yang mengancam nyawa manusia. Pesakit diabetes bukan sahaja terdiri daripada orang dewasa atau orang tua, tetapi juga daripada kalangan bayi dan kanak-kanak. Pesakit diabetes perlu memantau kandungan glukos dalam darah dengan kerap bagi menentukan pengambilan dos insulin pada satu-satu masa. Di samping itu, mereka juga memerlukan pemantauan yang lebih intensif dan berterusan untuk memastikan kandungan glukos dalam darah adalah sentiasa pada paras normal. Teknik yang selalu digunakan untuk memantau glukos dalam darah adalah invasif atau separa invasif. Kedua –dua teknik ini mempunyai ketepatan bacaan yang tinggi tetapi menyebabkan rasa sakit pada pengguna dan risiko jangkitan kuman adalah lebih tinggi. Sebagai alternatif, teknik yang tidak invasif telah diperkenalkan sebagai salah satu cara untuk mengurangkan rasa sakit dan jangkitan pada pengguna. Dalam projek ini, satu kajian telah dijalankan untuk menentukan pengesan *infrared* dekat mana yang paling baik dalam mengesan larutan glukos. Tiga pengesan *infrared* dekat yang berbeza *wavelength* telah digunakan dalam projek ini. Beberapa eksperimen telah dijalankan untuk mencari hubungan antara voltan dan kepekatan glukosa. Keputusan daripada eksperimen membuktikan bahawa hubungan linear antara voltan output dan kepekatan glukosa adalah *significant*.

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LIST OF ABBREVIATION

NIR	Near Infrared
MID	Mid Infrared
nm	nanometre
IDE	Integrated Development Environment
LCD	Liquid Crystal Display
LED	Light Emitting Diode
Mg/dl	Miligram per decilitre
ml	millilitre
USB	Universal Serial Bus
V	Voltage

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