UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF NON-CONTACT LEVEL MEASUREMENT INSPECTION SYSTEM WITH IOT APPLICATION

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronics Engineering Technology (Industrial Electronics) with Honours.

by

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I hereby, declared this report entitled DEVELOPMENT OF NON-CONTACT LEVEL MEASUREMENT INSPECTION SYSTEM WITH IOT APPLICATION is the results of my own research except as cited in references.

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronics Engineering Technology (Industrial Electronics) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Manusia sering melakukan kesilapan dan tidak dapat mengekalkan tumpuan yang konsisten pada tiap-tiap masa. Tumpuan manusia akan terjejas akibat banyak faktor seperti kekurangan tidur, nutrisi yang tidak mencukupi dan sebagainya. Projek ini dinamakan Pembangunan Sistem Pemeriksaan Tahap Tanpa Hubungan dengan Aplikasi Objek Rangkaian Internet. Sistem ini dibina menggunakan mikropengawal berasaskan Arduino yang mempunyai modul Wi-Fi ESP8266. Tujuan sistem ini dibina adalah untuk menyelesaikan masalah sistem pemeriksaan kini yang memerlukan pantauan pengguna yang kerap. Sistem ini direkabentuk untuk mengesan ralat sensor Ultrasonik yang digunakan di pelbagai syarikat pembuatan dan lain-lain syarikat dalam bidang kejuruteraan. Sistem ini akan mengesan ralat sensor Ultrasonik secara automatik dan dapat menghantar data-data ralat yang dikesan ke laman sesawang yang seterusnya boleh diakses untuk pemantauan dan pengawalan dari jarak yang jauh. Akhir sekali, sistem ini dapat memudahkan kerja mengesan ralat sensor Ultrasonik secara konsisten dan seterusnya dapat meningkatkan produksi syarikat pembuatan dan syarikat lain-lain dalam bidang kejuruteraan tanpa bergantung kepada servis syarikat luar.

ABSTRACT

Humans are prone to making mistakes and cannot maintain their attention consistently always. Human attention span is affected by several factors such as lack of sleep, lack of nutrition and so on. This project is named as Development of Non-Contact Level Measurement Inspection System with IoT Application. This system is built using microcontroller based on the Arduino platform with an embedded ESP8266 Wi-Fi module. The reason for the development of the system is to address the issue in the current inspection system used that require constant monitoring from its user. This system is designed and develop to detect the errors of the Ultrasonic sensor used in many manufacturing companies and other companies in engineering field. This product can be used to detect the error and effectively compensates it to improve its accuracy by analyzing the data taken from samples of different level to find the correlation between error and distance for the Ultrasonic Sensor allowing the user to use the data for calibration purposes. Furthermore, this project can establish communication with a webserver for the user to control and view the data from a webpage at a significantly lower cost when compared to sending the sensors to be calibrated using a third-party service which will then increase the productivity of many manufacturing companies along with companies in engineering field.

DEDICATION

This report is dedicated to my beloved parents for all their help in providing financial and emotional support.

I also dedicate this report to all my lecturers who painstakingly provided me with knowledge and the help necessary to complete this project.

Special thanks to En. A Shamsul Rahimi A Subki who is my project supervisor who guides me all throughout this project.

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m/s	-	Meter Per Second
µS	-	Micro Second
cm	-	Centimeter

LIST OF ABBREVIATIONS

SQL	-	Structured Query Language
IoT	-	Internet of Things
GUI	-	Graphical User Interface
LDR	-	Light Dependent Resistor
CCD	-	Charged Couple Device
ARV	-	Automatic Robotic Vehicle
SWOD	-	Spinning Wheel of Death
SOC	-	System on a chip
TCP/IP	-	Transmission Control Protocol / Internet Protocol
LAN	-	Local Area Network
AES	-	Automated Enforcement System
CNC	-	Computer Numerical Control
PHP	-	Hypertext Preprocessor
PC	-	Personal Computer
IDE	-	Integrated Development Environment
IO	-	Input / Output
API	-	Application Programming Interface
HTML	-	Hypertext Markup Language
CSS	-	Cascading Style Sheets
PIC	-	Peripheral Interface Controller

PCB	-	Printed Circuit Board
Wi-Fi	-	Wireless Fidelity
IDE	-	Integrated Development Environment