

INTISARI

Rancang Bangun Sistem *Smart Face Shield* Pengukur Suhu Tubuh Non Kontak dengan Sistem Manajemen Basis Data (SMBD) MySQL beserta Analisis Kemetrologiannya

Oleh

Lina Marcelina
17/410991/SV/12918

Sistem pengawasan kesehatan selalu menjadi topik penting dalam penelitian rekayasa biomedis dunia khususnya di Indonesia. Permasalahan ini semakin dirasakan kegentingannya setelah adanya identifikasi *coronavirus disease 19* (Covid 19) pada akhir Desember silam. Melalui Tim Gugus Tugas Percepatan Penanganan Covid-19 Pemerintah Indonesia mengeluarkan beberapa protokol kesehatan yang diantaranya adalah penggunaan pelindung wajah baik berupa masker atau *face shield* dan pemeriksaan suhu tubuh secara berkala pada beberapa ruang publik. Saat ini pengukuran suhu tubuh sebagian besar dilakukan secara non kontak menggunakan thermometer inframerah genggam melalui petugas pemeriks. Metode seperti ini kurang efektif dan efisien karena masih melibatkan secara langsung manusia dalam proses pengukuran suhu tubuh, tidak ada pengarsipan data identitas dan hasil pengukuran objek ukur, tidak adanya sistem peringatan dini suhu di luar batas normal dan tidak adanya sistem pengawasan jarak jauh.

Pada penelitian ini dilakukan pengembangan sistem pengukuran suhu tubuh manusia secara non kontak yang dilengkapi dengan identifikasi data, sistem monitoring *direct interface* dan *website*, penyimpanan data berbasis database sistem manajemen basis data MySQL yang telah diintegrasikan dengan *web hosting* serta sistem notifikasi suhu tubuh di luar batas normal yang diterapkan melalui rancang bangun sistem *smart face shield* dan buzzer aktif. Pengukuran suhu tubuh dilakukan secara non kontak oleh sensor inframerah GY – 906 MLX90614, dengan sistem identifikasi data diri menggunakan sensor dan kartu RFID RC522 13.56 Mhz serta LCD I2C 16 x 2 sebagai *direct interface*. Jenis prosesor yang digunakan yaitu mikrokontroler NodeMCU ESP8266 LiLon Versi 1 Anofficial dengan sistem *charger power supply 5 V* dari *power bank* .

Dari hasil kalibrasi dan analisis secara matematis dengan tingkat kepercayaan 95% dan faktor cakupan 2 mendapatkan nilai ketidakpastian rata-rata $\pm 0,27^{\circ}\text{C}$ dengan margin error rata-rata 6.56%. Hal ini dapat disebabkan karena ketidaklinieran dan ketidakakuratan sensor. Sedangkan untuk kecepatan pengiriman data ke sistem database memiliki koreksi 17 detik dari *delay* yang sudah diatur dalam program arduino.

Kata kunci : suhu tubuh, termometer, face shield, *web hosting*, kalibrasi

ABSTRACT

Design and Development of The Smart Face Shield System of Non Contact Body Temperature Based on Management System Basis Data (MSBD) MySQL with Metrological Aspect

By

Lina Marcelina
17/41099I/SV/12918

Health surveillance systems have always been an important topic in world biomedical engineering research, especially in Indonesia. This problem was increasingly felt after the identification of coronavirus disease 19 (Covid 19) at the end of last December. Through the Task Force for the Acceleration of Handling Covid-19, the Indonesian Government issued several health protocols, including the use of face shields in the form of masks or face shields and periodic body temperature checks in several public spaces. Currently, most body temperature measurements are carried out non-contact using a handheld infrared thermometer through an inspection officer. This method is less effective and efficient because it still involves humans directly in the process of measuring body temperature, there is no archiving of identity data and measurement results of measuring objects, there is no archiving of identity data and measurement results of measuring objects, there is no early warning system for temperatures outside normal limits and the absence of a remote monitoring system.

In this study, the development of a non-contact body temperature measurement system equipped with a data identification system, direct interface and website monitoring system, database-based data storage, MySQL database management system that has been integrated with web hosting, and a body temperature notification system outside normal limits which is applied through the design of a smart face shield and active buzzer system. Body temperature measurements are carried out non-contact by infrared sensor GY - 906 MLX90614, with self data identification system using RFID sensor RC522 13.56 Mhz, and LCD I2C 16 x 2 as direct interface. The type of processor used is the NodeMCU ESP8266 LiLon Version 1 Anofficial microcontroller with a 5 V power supply charger system from the power bank.

From the results of the calibration and mathematical analysis with a confidence level of 95% with a coverage factor of 2, the mean uncertainty value is $\pm 0.27^{\circ}\text{C}$ with an average error margin of 6.56%. This can be due to non-linearity and inaccuracy of sensors. Meanwhile, the speed of data transmission to the database system has a correction of 17 seconds from the delay that has been set in the Arduino program.

Keywords: *body temperature, thermometer, face shield, web hosting, calibration*