

ABSTRAK

ANALISIS STABILITAS DAN AKURASI PENGUKURAN SUHU WAJAH BERBASIS KAMERA TERMAL PADA SUBJEK AUTISME

(2026: + 81 Halaman+ 27 Gambar + 12 Tabel + 36 Daftar Pustaka + 10 Lampiran)

HUSWATUN HASANAH S

062240342207

SARJANA TERAPAN TEKNIK ELEKTRO

TEKNIK ELEKTRO

POLITEKNIK NEGERI SRIWIJAYA

Anak-anak dengan Gangguan Spektrum Autisme (ASD) umumnya memiliki sensitivitas tinggi terhadap kontak fisik sehingga pengukuran suhu tubuh tanpa kontak menjadi alternatif yang lebih nyaman dan aman. Penelitian ini bertujuan menganalisis stabilitas dan akurasi pengukuran suhu wajah menggunakan kamera termal MLX90640 yang terintegrasi dengan Raspberry Pi dan model Convolutional Neural Network (CNN). Data diperoleh melalui pengambilan citra termal wajah subjek autisme, kemudian dilakukan tahap prapemrosesan, pelatihan model, dan pengujian. Stabilitas sistem dievaluasi menggunakan nilai rata-rata (mean) dan standar deviasi (SD) dari pengukuran berulang, sedangkan akurasi dianalisis berdasarkan Mean Absolute Error (MAE), Mean Squared Error (MSE), dan Root Mean Squared Error (RMSE) antara suhu aktual dan prediksi. Hasil menunjukkan sistem menghasilkan pengukuran yang stabil dengan standar deviasi rendah serta mampu memprediksi suhu wajah dengan tingkat kesalahan kecil. Sistem ini berpotensi menjadi solusi pengukuran suhu wajah tanpa kontak yang nyaman dan andal bagi penyandang autisme.

Keywords : Autism Spectrum Disorder, MLX90640, Convolutional Neural Network (CNN)

ABSTRACT

ANALYSIS OF THE STABILITY AND ACCURACY OF THERMAL CAMERA-BASED FACIAL TEMPERATURE MEASUREMENTS IN INDIVIDUALS WITH AUTISM

(2026: + 81 Pages + 27 Figures + 12 Tables + 36 References + 10 Attachments)

HUSWATUN HASANAH S

062240342207

BACHELOR OF APPLIED ELECTRICAL ENGINEERING

ELECTRICAL ENGINEERING DEPARTMENT

STATE POLYTECHNIC OF SRIWIJAYA

Children with Autism Spectrum Disorder (ASD) often exhibit high sensitivity to physical contact, making non-contact body temperature measurement a more comfortable and safe alternative. This study aims to analyze the stability and accuracy of facial temperature measurements using an MLX90640 thermal camera integrated with a Raspberry Pi and a Convolutional Neural Network (CNN) model. Data were obtained by capturing thermal images of the faces of autistic subjects, followed by preprocessing, model training, and testing phases. System stability was evaluated using the mean and standard deviation (SD) of repeated measurements, while accuracy was analyzed based on Mean Absolute Error (MAE), Mean Squared Error (MSE), and Root Mean Squared Error (RMSE) between actual and predicted temperatures. The results demonstrate that the system produces stable measurements with low standard deviation and is capable of predicting facial temperature with a low error rate. This system holds potential as a comfortable and reliable non-contact facial temperature measurement solution for individuals with autism.

Keywords : *Autism Spectrum Disorder, MLX90640, Convolutional Neural Network (CNN)*