

## ABSTRAK

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Judul Laporan Skripsi : Prediksi Anak Penderita Autism Spectrum Disorders Berdasarkan Citra Wajah Menggunakan Metode Convolutional Neural Network (CNN)  
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Autism Spectrum Disorders (ASD), adalah salah satu gangguan neurobiologis yang mempengaruhi perkembangan sosial, komunikasi, dan perilaku pada anak-anak. Deteksi dini ASD sangat penting untuk memberikan intervensi yang tepat dan meningkatkan hasil perkembangan anak. Menurut Kemenkes, periode tahun 2020-2021 di Indonesia, dilaporkan sebanyak 5.530 kasus gangguan perkembangan pada anak, termasuk gangguan spektrum autisme yang mendapatkan layanan di Puskesmas. Penelitian ini bertujuan untuk mengembangkan metode prediksi yang efisien untuk mengidentifikasi anak-anak penderita ASD berdasarkan analisis citra wajah menggunakan salah satu algoritma *Deep Learning* yaitu Convolutional Neural Network (CNN) dan arsitektur CNN yaitu EfficientNet B3.

Penelitian diharapkan dapat memudahkan dalam membedakan antara anak autisme dan non-autisme melalui analisis karakteristik wajah mereka. Untuk mencapai hal ini, peneliti menggunakan dataset anak-anak autis yang berisi 2.940 citra wajah, dengan rincian 1.470 citra wajah anak-anak autis dan 1.470 citra wajah anak-anak non-autis. Hasil penelitian ini menunjukkan bahwa model yang dibuat dalam 3 (tiga) skenario pembagian dataset, mampu memprediksi citra wajah anak dengan autisme dan wajah anak tanpa autisme dengan baik dan cukup akurat dengan *performance measure* model dari skenario terbaik yaitu *accuracy* 84.35%, *precision* 84.67%, *recall* 84.35%, dan *f1-score* 84.32%.

**Kata Kunci :** *Autism Spectrum Disorders (ASD), Deep Learning, Convolutional Neural Network (CNN), EfficientNet, Analisis Citra Wajah.*

## ABSTRACT

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*Autism Spectrum Disorders (ASD) are neurobiological disorders that affect the social, communication, and behavioral development in children. Early detection of ASD is crucial to provide appropriate interventions and improve child development outcomes. According to the Ministry of Health, in the period between 2020-2021 in Indonesia, it was reported that there were 5,530 cases of developmental disorders in children, including autism spectrum disorders receiving services at Puskesmas (Community Health Centers).*

*This research aims to develop an efficient prediction method to identify children with ASD based on facial image analysis using one of the Deep Learning algorithms, Convolutional Neural Network (CNN), and the CNN architecture EfficientNet B3. The study is expected to facilitate the distinction between children with autism and those without autism through the analysis of their facial characteristics. To achieve this, researchers used a dataset of autistic children containing 2,940 facial images, with details of 1,470 images of autistic children and 1,470 images of non-autistic children. The results of this study show that the model created in 3 dataset splitting scenarios can predict facial images of children with autism and those without autism effectively and quite accurately, with the performance measures of the model from the best scenario being accuracy of 84.35%, precision of 84.67%, recall of 84.35%, and f1-score of 84.32%.*

**Keywords:** *Autism Spectrum Disorders (ASD), Deep Learning, Convolutional Neural Network (CNN), EfficientNet, Facial Image Analysis.*