# ABSTRAK

Perkembangan teknologi *Generative AI* saat ini mampu menghasilkan citra wajah palsu yang sulit dibedakan secara visual, sehingga berisiko disalahgunakan untuk penipuan dan pemalsuan identitas. Penelitian ini bertujuan mengklasifikasikan citra wajah asli dan citra wajah hasil *Generative AI* menggunakan algoritma *XGBoost* berbasis ekstraksi fitur tekstur dan warna. Fitur tekstur diekstraksi menggunakan metode *Gray Level Co-occurrence Matrix (GLCM)* pada empat orientasi sudut (0°, 45°, 90°, dan 135°) dengan jarak 1 piksel, menghasilkan 16 fitur berupa *energy*, *contrast*, *homogeneity*, dan *entropy*. Fitur warna diekstraksi melalui konversi ruang warna *RGB* ke *YCbCr* dengan menghitung nilai *mean* dan standar deviasi pada kanal *Y*, *Cb*, dan *Cr*, menghasilkan 6 fitur, sehingga total diperoleh 22 fitur gabungan. Dataset berjumlah 750 citra, terdiri atas 375 citra asli dan 375 citra hasil *Generative AI*, dibagi dengan rasio 80:20 menjadi 600 data latih dan 150 data uji, serta dinormalisasi menggunakan *StandardScaler* sebelum pelatihan model. Evaluasi menggunakan *confusion matrix* menunjukkan model berhasil memprediksi 59 dari 75 citra asli dan 65 dari 75 citra *AI* dengan benar, menghasilkan *accuracy* 82,67%, *precision* 80,25%, *recall* 86,67%, dan *F1-score* 83,33%. Analisis *feature importance* menunjukkan fitur *cr_std* (*gain* 0,74) dan *contrast_0* (*gain* 0,68) sebagai fitur paling berpengaruh dalam klasifikasi. Penelitian ini membuktikan bahwa fusi fitur tekstur dan warna dengan *XGBoost* efektif, ringan secara komputasi, dan mudah diinterpretasikan dibandingkan pendekatan *deep learning* untuk mendeteksi citra wajah hasil *Generative AI*.

***Kata kunci***: *Generative AI, XGBoost, GLCM, YCbCr, Klasifikasi Citra.*

# *ABSTRACT*

*The development of Generative AI technology today is capable of producing fake facial images that are difficult to distinguish visually, thus posing a risk of being misused for fraud and identity forgery. This research aims to classify real facial images and facial images generated by Generative AI using the XGBoost algorithm based on texture and color feature extraction. Texture features are extracted using the Gray Level Co-occurrence Matrix (GLCM) method at four angular orientations (0°, 45°, 90°, and 135°) with a distance of 1 pixel, producing 16 features consisting of energy, contrast, homogeneity, and entropy. Color features are extracted through the conversion of the RGB color space to YCbCr by calculating the mean and standard deviation values of the Y, Cb, and Cr channels, producing 6 features, resulting in a total of 22 combined features. The dataset consists of 750 images, consisting of 375 real images and 375 Generative AI generated images, divided at a ratio of 80:20 into 600 training data and 150 test data, and normalized using StandardScaler before model training. Evaluation using a confusion matrix shows that the model successfully predicts 59 out of 75 real images and 65 out of 75 AI-generated images correctly, resulting in an accuracy of 82.67%, precision of 80.25%, recall of 86.67%, and an F1-score of 83.33%. Feature importance analysis shows that the cr_std feature (gain 0.74) and contrast_*0 *(gain 0.68) are the most influential features in the classification. This research proves that the fusion of texture and color features with XGBoost is effective, computationally lightweight, and easy to interpret compared to deep learning approaches for detecting facial images generated by Generative AI.*



*Keywords: Generative AI, XGBoost, GLCM, YCbCr, Image Classification*