

PENERAPAN ALGORITMA *CONVOLUTIONAL NEURAL NETWORK*(CNN) UNTUK KLASIFIKASI ALAT MUSIK TRADISIONAL DI BLITAR RAYA

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ABSTRAK

Berdasarkan hasil penelitian, sistem klasifikasi alat musik tradisional yang dibangun menggunakan algoritma *Convolutional Neural Network* (CNN) berhasil mencapai akurasi pelatihan sebesar 95% dengan nilai F1-Score rata-rata mencapai 0,97. Model ini dilatih selama 25 *epoch* dengan waktu pelatihan sekitar 22 menit menggunakan total data latih sebanyak 600 gambar dan diuji pada 30 gambar data uji, menghasilkan tingkat akurasi pengujian sebesar 86,67%. Sistem ini mampu mengenali enam jenis alat musik tradisional yang berasal dari wilayah Blitar Raya, yaitu Balungan, Bonang, Gambang, Kendang, Rebab, dan Slenthoh. Meskipun kinerja model tergolong baik, pengembangan lanjutan tetap diperlukan agar sistem lebih bermanfaat secara luas. Sistem ini dapat dikembangkan menjadi aplikasi berbasis Android atau website yang lebih menarik dan interaktif, sehingga mudah diakses oleh masyarakat umum. Selain itu, cakupan alat musik tradisional yang dikenali dapat diperluas ke seluruh Jawa Timur atau bahkan Indonesia guna mendukung pelestarian budaya nasional. Model CNN yang digunakan juga dapat disederhanakan agar lebih ringan dan efisien, dengan waktu pelatihan yang lebih cepat namun tetap menghasilkan performa klasifikasi yang optimal. Dengan berbagai pengembangan tersebut, sistem ini diharapkan mampu memberikan kontribusi nyata dalam pelestarian kebudayaan lokal melalui penerapan teknologi kecerdasan buatan.

Kata Kunci— *Convolutional Neural Network*, Klasifikasi Gambar, Alat Musik Tradisional, Pelestarian Budaya, Streamlit

APPLYING THE CONVOLUTIONAL NEURAL NETWORK (CNN) ALGORITHM FOR CLASSIFYING TRADITIONAL MUSICAL INSTRUMENTS IN THE BLITAR RAYA REGION

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ABSTRACT

The findings of the research indicate that the conventional musical instrument classification system constructed with the Convolutional Neural Network (CNN) algorithm attained a training accuracy of 95%, accompanied by an average F1-Score of 0.97. The model underwent a training process comprising 25 epochs, with a total training time of approximately 22 minutes. This training process involved the utilization of 600 training images. Subsequently, the model was assessed on 30 test images, leading to an accuracy rate of 86.67%. The system is capable of recognizing six types of traditional musical instruments originating from the Blitar Raya region: Balungan, Bonang, Gambang, Kendang, Rebab, and Slentho. Despite the model's acknowledged efficacy, further development is necessary to enhance its general utility. The system's potential for enhancement as an appealing and interactive Android-based application or website is significant, with the prospect of enhancing accessibility to the general public. Furthermore, the scope of recognized traditional musical instruments could be expanded to encompass all of East Java or even Indonesia to support the preservation of national culture. The CNN model could be simplified to reduce its complexity, thereby enhancing its efficiency and reducing its training time. This approach would allow the model to achieve optimal classification performance while maintaining a lightweight design. These developments have led to the anticipation that the system will make a substantial contribution to the preservation of local culture through the application of artificial intelligence technology.

Keywords— *cultural preservation, machine learning, Streamlit, traditional musical instruments*