ABSTRACT

SEMARANG BATIK MOTIF CLASSIFICATION USING CONVOLUTIONAL NEURAL NETWORK WITH VGG16 ARCHITECTURE.

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Batik Semarang is a cultural heritage of Indonesia with high aesthetic and philosophical value, characterized by distinctive patterns such as Asem Arang, Blekok Warak, Gambang Semarangan, Kembang Sepatu, and Semarangan.Manual recognition of these patterns still requires specific expertise, thus this study aims to develop an automatic classification system using Convolutional Neural Network (CNN) with the VGG16 architecture and a transfer learning approach. A total of 1,360 image samples were collected from Kaggle and preprocessed by resizing to 224×224 pixels and normalizing pixel values. The model was trained using various parameter combinations, including optimizer types, learning rates, and epochs. The best performance was achieved using the SGD optimizer with a learning rate of 0.01 and 50 epochs, resulting in 100% accuracy, precision, and fl - score, without signs of overfitting. Performance evaluation was conducted using a confusion matrix, classification report, and visualization of accuracy and loss graphs. The analysis showed the model effectively and consistently recognized all classes. To facilitate practical use, the model was integrated into a Streamlit interface, This research contributes to the digitalization and preservation of batik heritage through image-based pattern recognition technology.

Keywords: Batik, Classification, CNN, VGG16, Deep Learning.