

## ABSTRACT

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CONVOLUTIONAL NEURAL NETWORK METHOD APPLICATION ON  
ANDROID-BASED WEATHER CLASSIFICATION

Thesis. Informatics Major, Faculty of Industrial Technology, Gunadarma  
University, 2023

Keywords: Classification Weather, *Convolutional Neural Network*, Deep  
Learning, MobileNet, Android

(xiv + 80 + L-23)

Weather is the condition of the atmosphere or the environment around the earth at a particular place and time. Weather is one of the crucial factors that affect human daily life. Information about the weather can help someone plan, make decisions, and prepare for environmental conditions. Therefore, we need a system that can classify weather types accurately to provide reliable weather information. This research aims to develop an Android-based weather classification application using the Convolutional Neural Network (CNN) method with the MobileNet architecture. This research utilizes a dataset containing 1200 weather images taken from Kaggle.com. This dataset is grouped into four classes: foggy, shine, rainy, and cloudy. This research involved three main stages in the process. The first stage is data preprocessing, which involves three different data sharing scenarios: the first scenario with a comparison of training and validation data 90%:10%, the second scenario 80%:20%, and the third scenario 70%:30%. The model training process uses the transfer learning method, which helps speed up the model training time. Based on the test results using a confusion matrix with four types of measurements, namely accuracy, recall, precision, and F-1 score, the best model is obtained in the first scenario with a dataset comparison of 90%:10%, which produced an accuracy value of 98.25% for the training data and 97.52% for validation data. This research proves that the deep learning model with the MobileNet architecture can accurately classify weather images. The size of this application is about 110 MB. Testing the "black box" method on various menus in the application also runs smoothly according to its function purpose. Test results on five Android smartphones with different specifications confirm that this application runs well and is by the dimensions and screen size of the device used.

Bibliography (2004-2023)