

ABSTRACT

Skin cancers are one of the most dangerous cancer. In order to detect this cancer, the biopsy method is needed by dermatologist. Biopsy is a cancer identification method by picking a small part of the cancer then examining it under the microscope. This way will has injury risk despite having a great accuracy. Beside biopsy, the ABCDE method can be done to identify a particular skin lesion, which stands for *Assymetrical*, *Border*, *Color*, *Diameter*, and *Evolving*, but it requires a lot of knowledge and experience to diagnose a skin cancer. Besides those two techniques, dermatoscopic technique can be applied to detect a particular skin cancer. This technique requires a tool called dermatoscope which we can see the cancer clearly, but this technique still has an error risk.

There has been so many research about skin cancer classification with the help of computers. Therefore, the topic of this final project is to classify some skin cancers using deep learning. This research is only focused on development of deep learning algorithm and then analyze its performance. EfficientNetV2 is used to solve this skin cancers classification problem. EfficientNetV2 is the development of EfficientNet which is one of the Convolutional Neural Network (CNN) model. The dataset this research used is from HAM10000 which has 10.015 images consist of seven classes, including *Actinic keratoses*, *Basal cell carcinoma*, *Benign keratoses*, *Dermatofibroma*, *Melanocytic nevi*, *Melanoma*, and *Vascular*. This dataset was divided by three, which are 72% for training, 8% for validating, and 20% for testing. After the model is trained, the performance of it will be tested using accuracy, precision, recall, and f1-score parameters.

In this final project, the hyperparameter configurations with the best performance has been obtained, including the Adamax optimizer, learning rate of 0,001; batch size of 64, epoch of 50, image size of 260x260, the fine-tuned B2 variant of EfficientNetV2, and vertical & horizontal flip augmentation. With these configurations, the results obtained are accuracy of 89%, precision of 81%, recall of 80%, and f1-score of 80%.

Keywords: Convolutional Neural Network, EfficientNetV2, skin cancer