

# Abstract

Skin cancer, including Basal Cell Cancer (BCC), Squamous Cell Cancer (SCC), and Melanoma, is a significant health issue in Indonesia. The incidence of skin cancer ranges from 5.9% to 7.8% of all cancer types each year, with BCC being the most common (65.5%), followed by SCC (23%), and Melanoma (7.9%). Research on skin cancer detection, particularly Melanoma and Basal Cell Carcinoma, emphasizes the improvement of classification algorithms. Several studies have shown low accuracy, highlighting the importance of selecting the right classification algorithms. Although there are studies with high accuracy, there has been no development of an Android application using the models created. Therefore, further research is needed to develop an effective Android application for detecting skin cancer. It is important to thoroughly test the model and provide tangible benefits. Evaluating the performance of the prototype application is also a critical step. To address the issues outlined above, this thesis has the following objectives: 1. Conduct a study on three Ensemble Deep Learning algorithms. 2. Develop a skin cancer detection application based on the resulting model. 3. Evaluate the performance of the application. The methodology used in this thesis research involves analyzing the Ensemble Deep Learning Stacking algorithm, specifically using a Convolutional Neural Network (CNN) model combined with Long Short Term Memory (LSTM), Recurrent Neural Network (RNN), and Deep Neural Network (DNN) models. Additionally, this research includes the development of an Android application prototype and the evaluation of its performance. The results show that the stacking method applied to CNN and LSTM models with hyperparameter tuning can achieve the best performance, with accuracy, precision, recall, and F1 Score reaching 97.97%, as well as sensitivity of 97.22% and specificity of 97.62%. Additionally, the developed prototype successfully detected images of melanoma and basal cell carcinoma skin cancer as well as normal skin for comparison.

**Kata Kunci:** *Melanoma, Basal Cell Carcinoma (BCC), Ensemble Deep Learning, Convolutional Neural Network (CNN), Recurrent Neural Network (RNN), Deep Neural Network (DNN), Long Short Term Memory (LSTM).*