

## ABSTRACT

*Skin cancer is one of the most prevalent types of cancer worldwide. Conventional diagnosis through biopsy has limitations in terms of cost, examination time, and subjectivity in dermoscopic image interpretation. This study compares the performance of skin cancer classification using feature extraction from ResNet50 and MobileNetV2 combined with machine learning algorithms (Support Vector Machine, Random Forest, Logistic Regression, Gradient Boosting), and CNN Scratch as a baseline, utilizing 3,297 dermoscopic images from International Skin Imaging Collaboration (ISIC). Results show that ResNet50+SVM achieves the best performance with 89.09% accuracy and 0.954 Area Under Curve (AUC), MobileNetV2 + SVM offers higher computational efficiency with 86.97% accuracy, while CNN Scratch demonstrates the best generalization stability with a 1.73% training-testing gap. The hybrid transfer learning approach proves to provide an optimal balance between accuracy and efficiency for skin cancer detection systems.*

**Keywords:** *skin cancer, ResNet50, MobileNetV2, transfer learning, image classification*