



NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Batch Number	BB-1
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Guide	Dr. Sireesha Moturi B.Tech, M.Tech, Ph.D
Title	A Meta-Ensemble Deep Learning Approach Using EfficientFormerV2 and Swin Tiny Transformer for Skin Lesion Classification
Domain/Technology	DEEP LEARNING
Base Paper Link	https://ieeexplore.ieee.org/document/10623626
Dataset Link	https://github.com/yelchurivinay/A-Large-Dataset-to-Enhance-Skin-Cancer-Classification-with-Transformer-Based-DNN/blob/main/README.md
Software Requirements	Browser: Any latest browser like Chrome Operating System: Windows 7 Server or later Python (COLAB)
Hardware Requirements	SystemType: Intel Core i5 or above RAM: 8 GB Number of cores:5 Number of Threads: 4
Abstract	Early and effective skin cancer identification significantly enhances patient prognosis, yet remains a complex challenge for automated interpretation due to nuanced lesion traits, feature overlaps, and limited annotated data. This study presents a meta-ensemble deep learning solution for the analysis of dermoscopic skin images, aiming to boost diagnostic performance. Two modern neural network models, EfficientFormerV2 and Swin Tiny Transformer, are independently trained on the HAM10000 dataset; each model contributes unique representational strengths toward lesion characterization. Their outputs are integrated through two ensemble strategies: a weighted soft-voting method combining prediction probabilities and a meta-learning approach wherein a logistic regression classifier utilizes model logits. The ensemble method's effectiveness is confirmed via comprehensive evaluation metrics, such as accuracy, confusion matrix, and class-specific ROC analysis, all indicating superior performance over individual networks. This framework highlights notable promise as a clinical decision-assist system, particularly valuable in constrained medical environments or high-volume screening settings.

Signature of the student(s)

Signature of the Guide

Signature of the project coordinator