

# Skin Cancer Detection

## Spreading Awareness with Deep Learning Techniques

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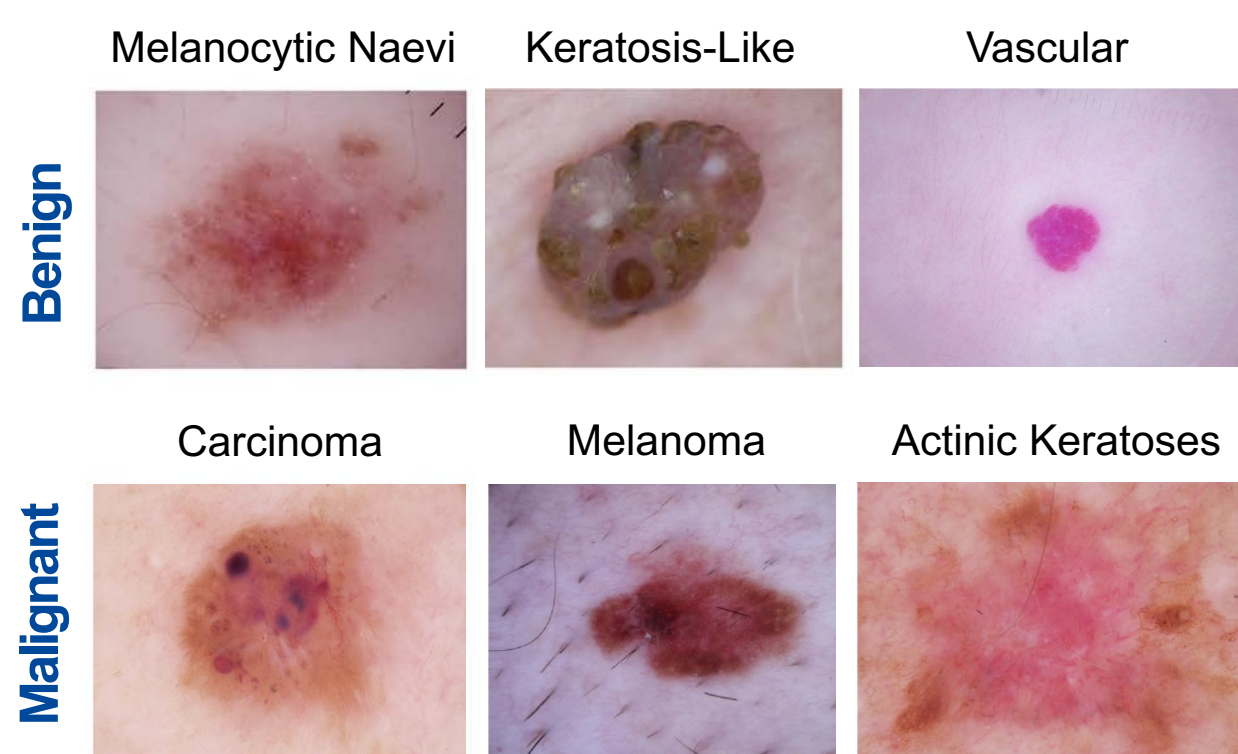
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### Project Objectives

This project aims to develop a deep learning model to provide lesion-specific diagnostics, to be deployed in unsupervised settings, with a supplementary smartphone application, improving the prognosis of patients with higher chances of a pleasant treatment.

### Methodology

The SkinMNIST HAM10000 dataset is used for model training, which is a collection of dermoscopy images.



Seven base CNN models were chosen for training on the dataset and evaluated on a set performance metric indicators with a test set. Based on the results, four top base models were selected based on F1-score and AUC-PR to create an ensemble model. Finally, the ensemble deep learning classifier's performance metrics are reported.

### Model Performance

Model	F1 score <sup>†</sup>	Accuracy	AUC-PR
Inception v3	0.74	0.86	0.72
VGG16	0.84	0.90	0.82
Xception	0.86	0.92	0.89
DenseNet201	<b>0.88</b>	<b>0.92</b>	<b>0.89</b>
InceptionResNet v2	<b>0.88</b>	<b>0.93</b>	<b>0.89</b>
ResNet50	0.88	0.93	0.88
EfficientNet B4	<b>0.88</b>	<b>0.93</b>	<b>0.90</b>
EfficientNet B6	<b>0.88</b>	<b>0.93</b>	<b>0.90</b>

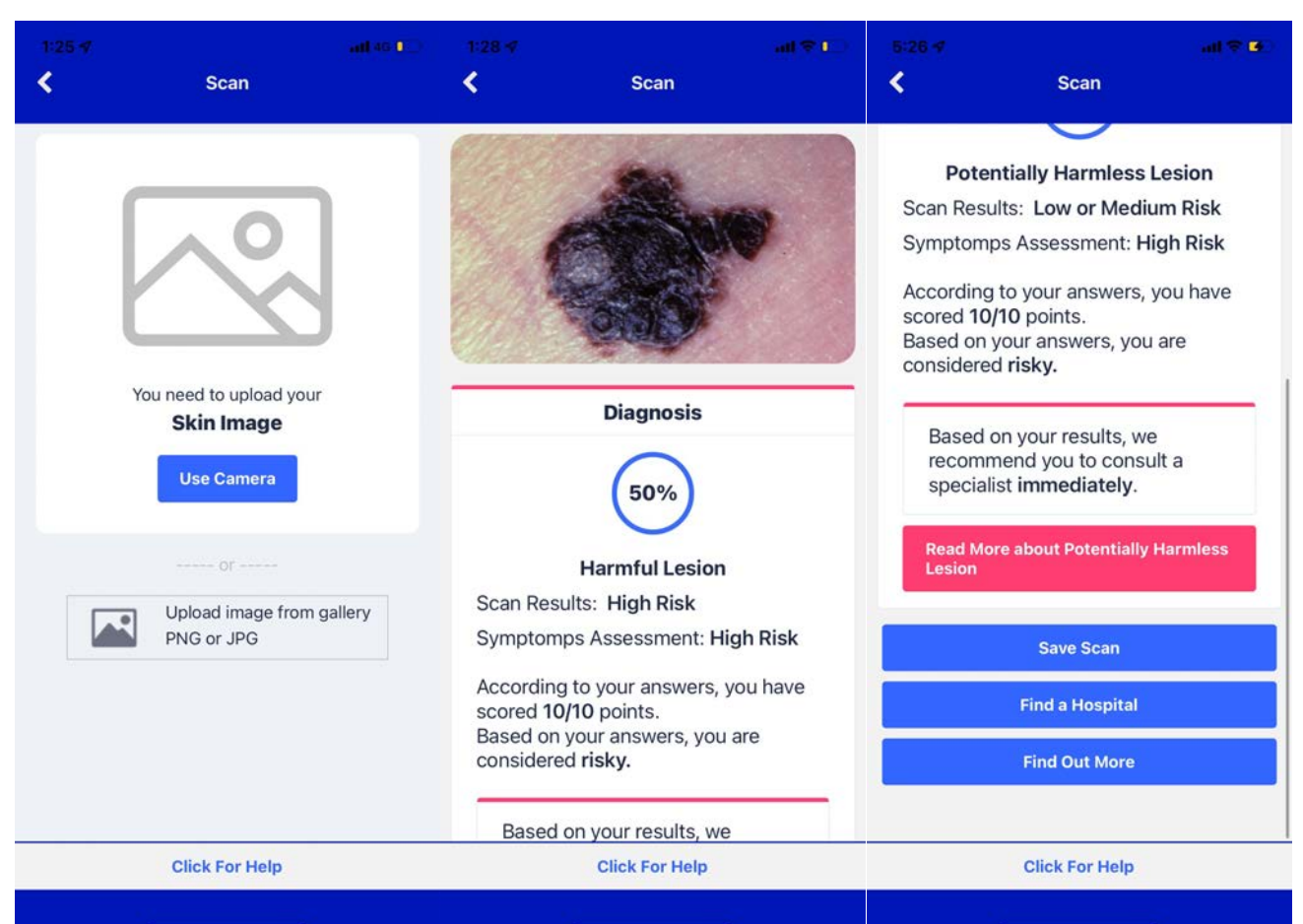
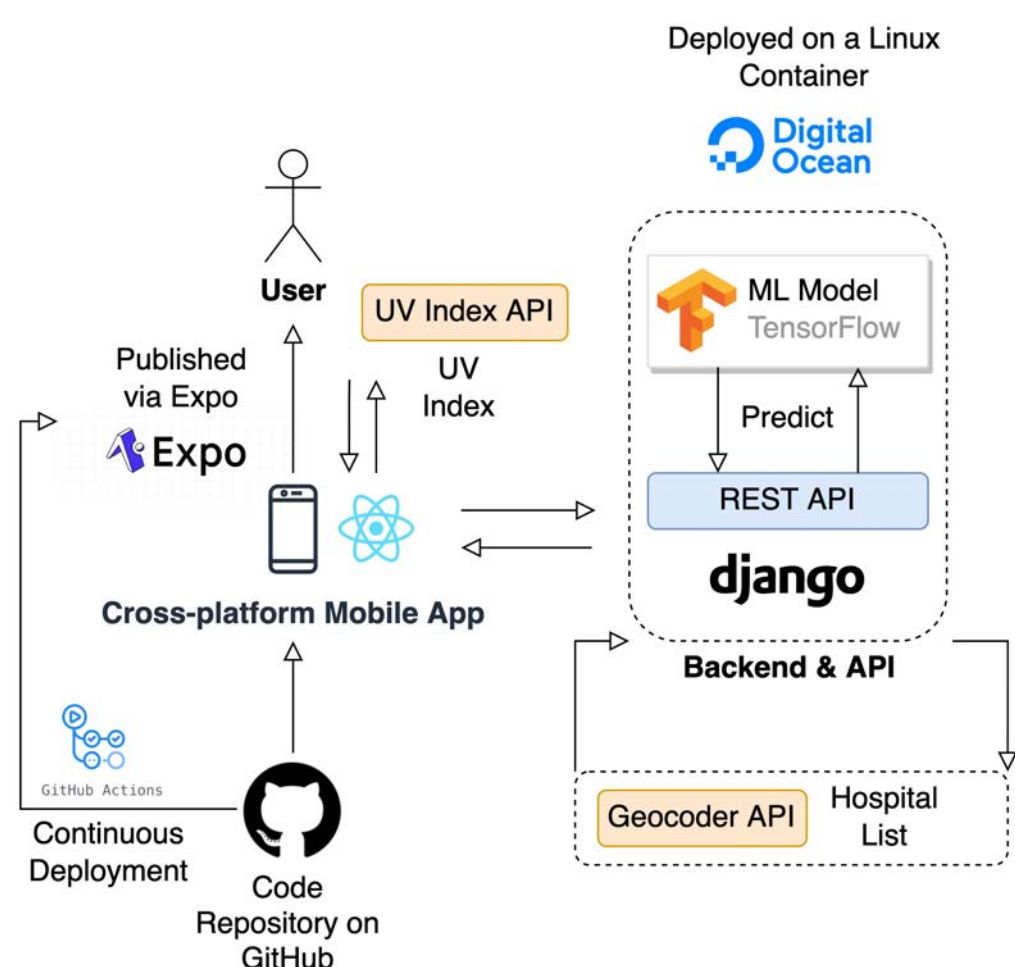
### Ensemble Model

The four models selected are InceptionResNetV2, DenseNet201, and B4, B6 variants of EfficientNet, with the following results\*.

**91%** **94%** **0.93**  
F1 score<sup>†</sup> Accuracy AUC-PR

### Smartphone Application

A cross-platform application is developed with React Native, connected via an API, deployed on the cloud.



<sup>†</sup> Macro Avg. F1 Score

\* on a fixed test set, from HAM10000