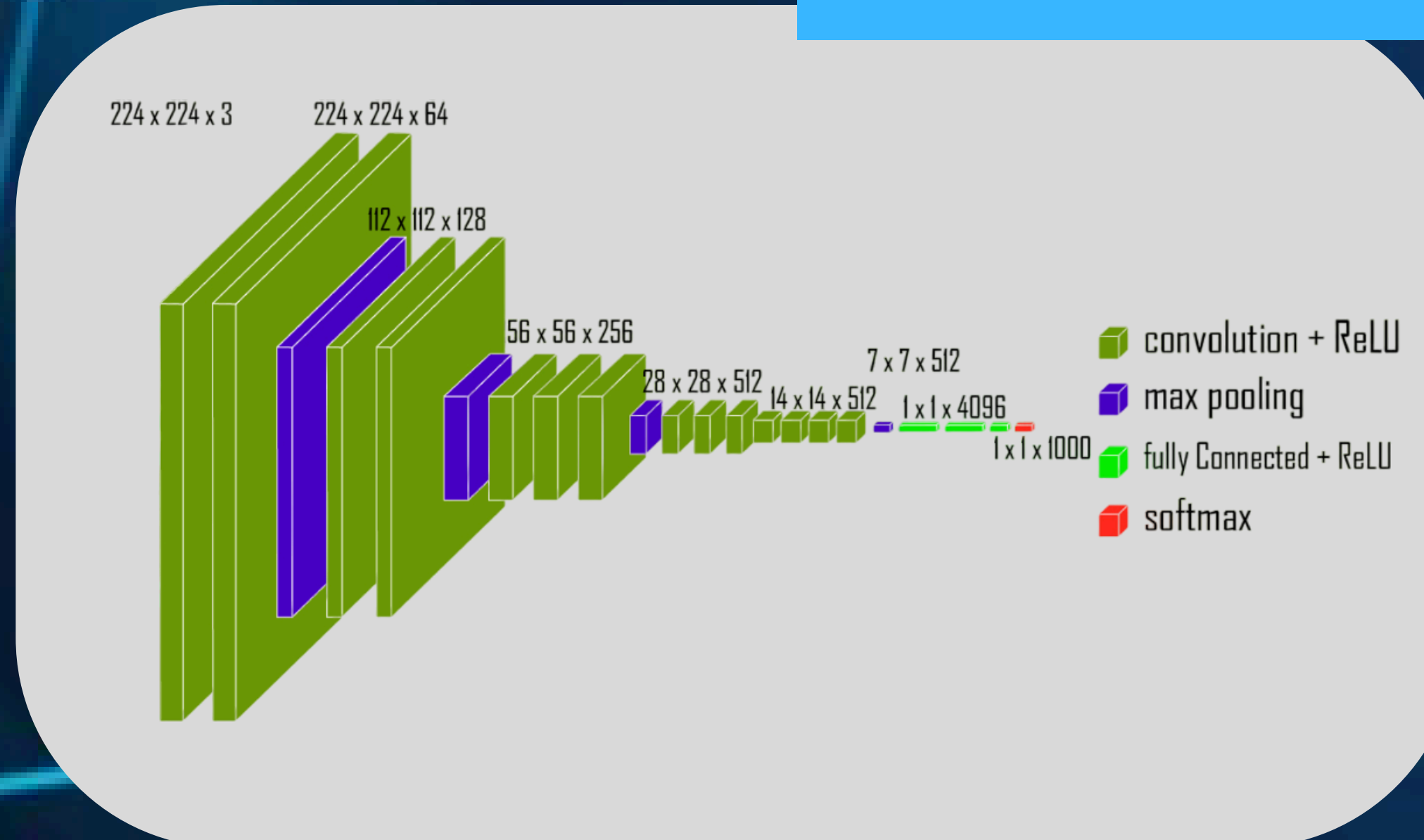


# The Role of AI in Skin Cancer Diagnostics: Examining CNN Models

## Introduction

With the rise of artificial intelligence, this technology is being applied in an increasing number of sectors. However, a field that heavily relies on imagery, such as dermatology for detecting melanomas, **lags behind** in its adoption. Why is this the case? **Is AI incapable of matching a physician's abilities**, or are other factors at play

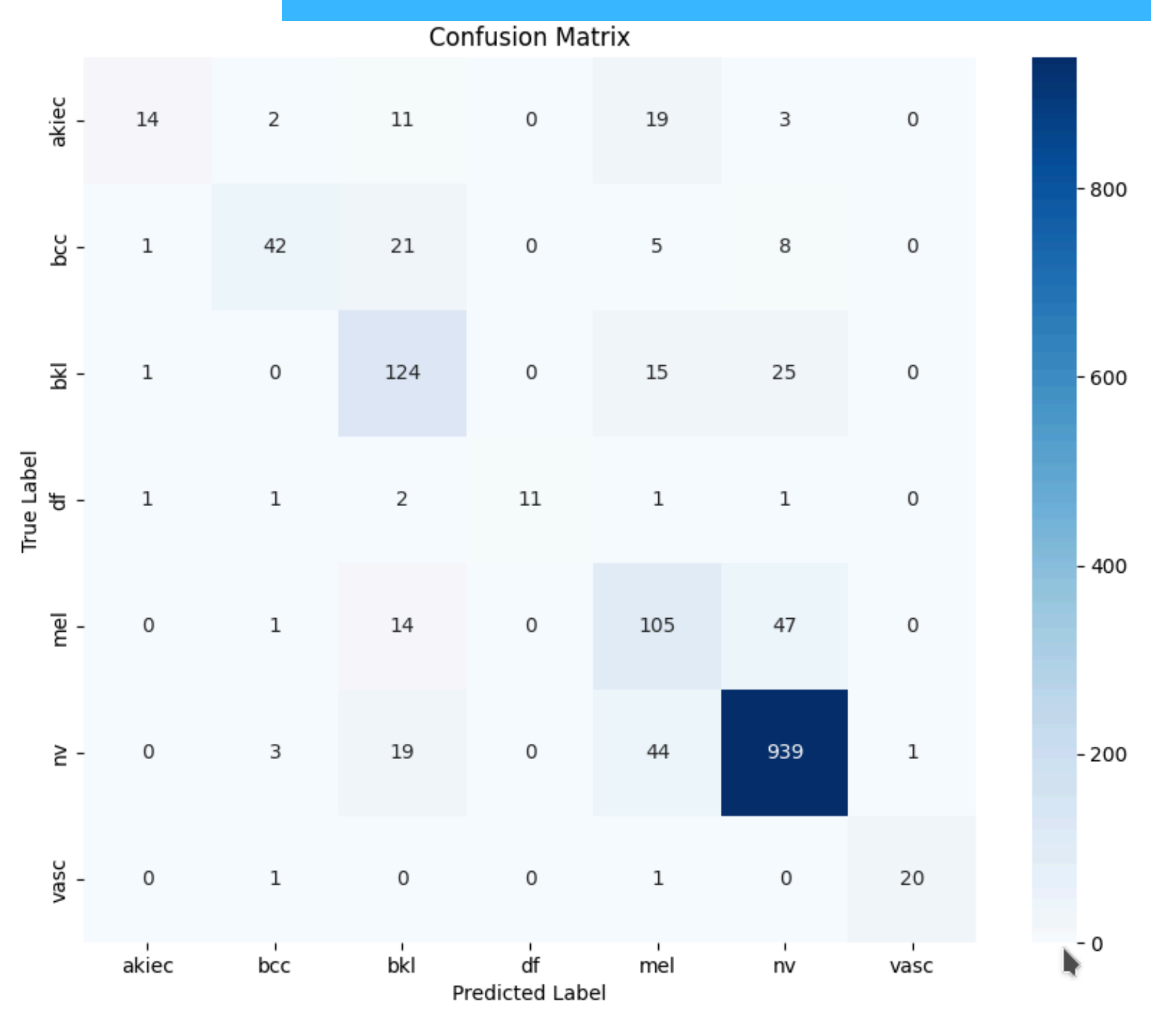
## How does a CNN model work?



For this research, I used two CNN models: **EfficientNetB0** and **ResNet50**. These models consist of several layers that work together to analyze and classify the image. .

- **Convolutional Layer:** This layer looks for simple patterns in the image.
- **Activation Function (ReLU):** After the convolution, the ReLU function is applied, which converts negative values to zero. This helps the model learn faster.
- **Pooling Layer:** The pooling layer reduces the image size by retaining the most important information and removing less important details.
- **Fully Connected Layer:** In this layer, the information from the previous layers is combined to understand complex patterns and make a prediction about what is present in the image.

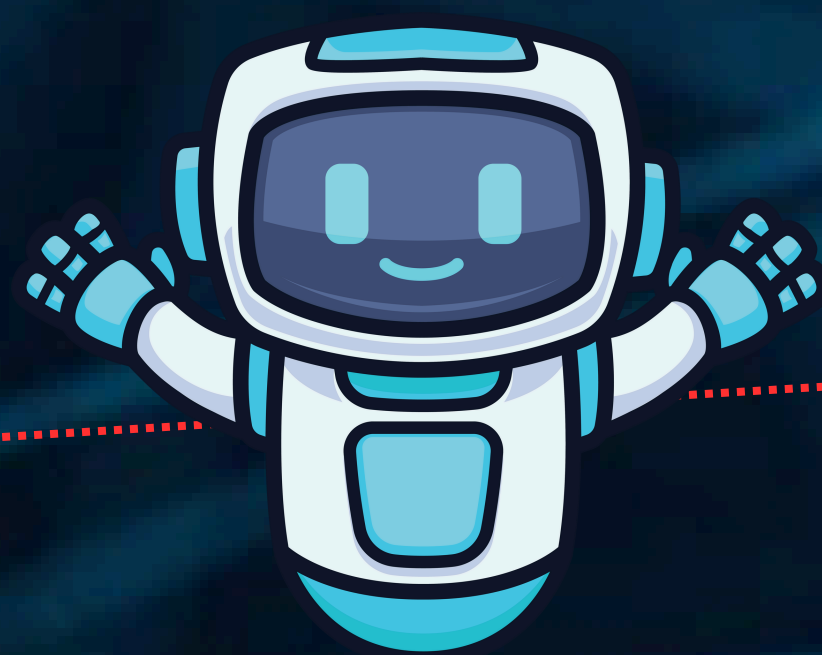
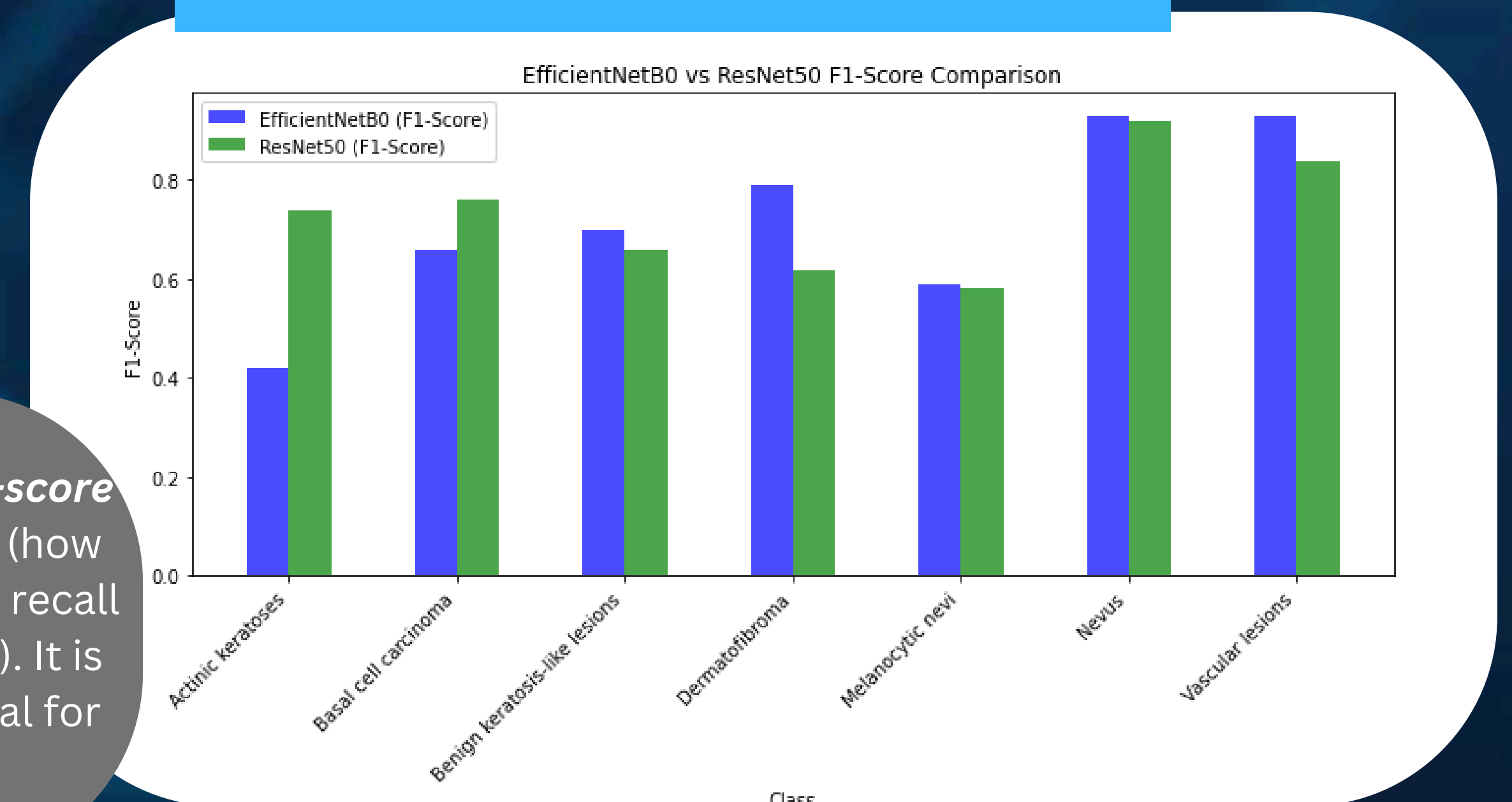
## How accurate was my best model?



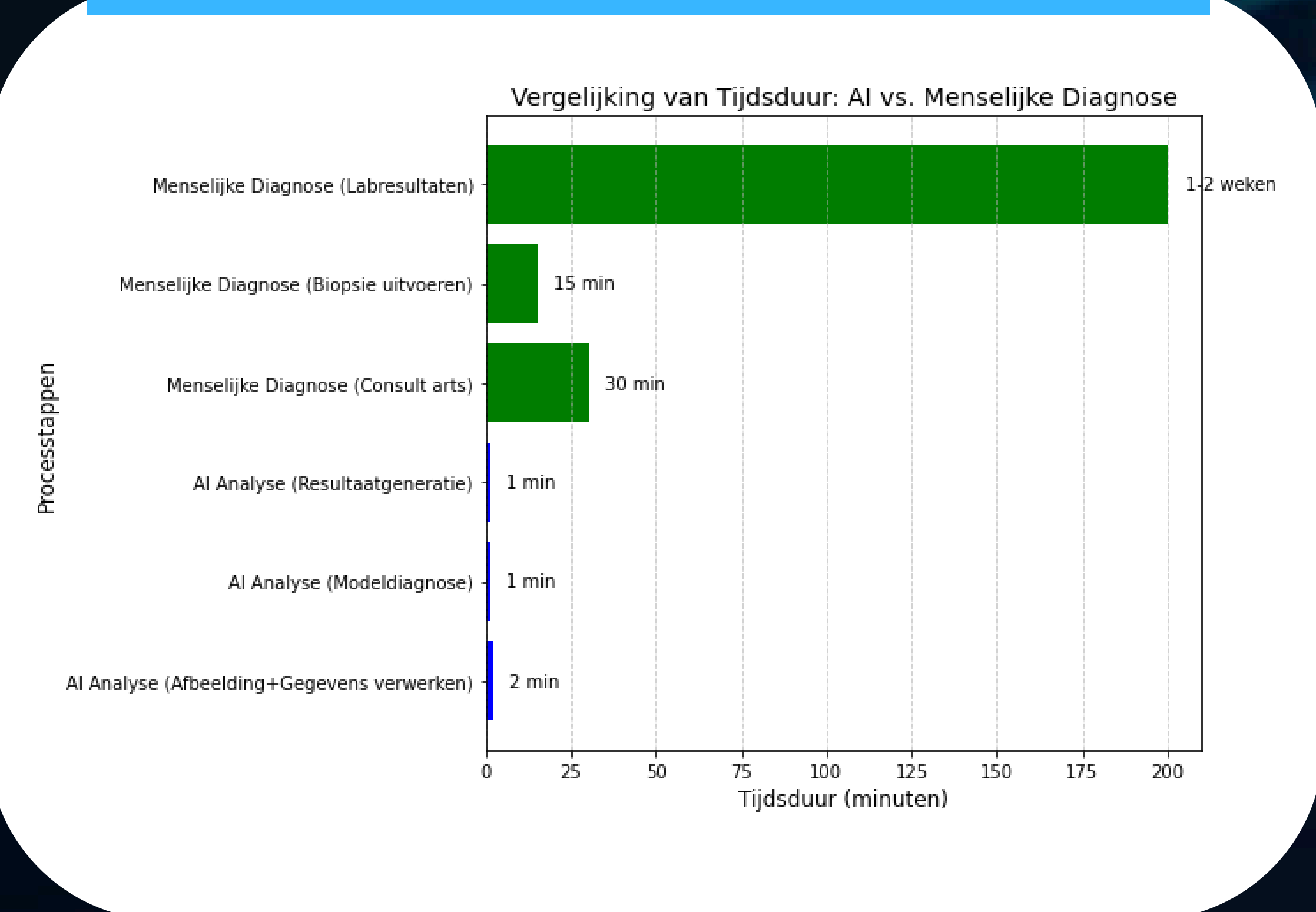
The matrix left shows the classification of different types of skin cancer, with the rows representing the **actual labels** and the columns representing the **predicted labels**. These results are from the **EfficientNetB0** model

Here on the right, you can see that the **F1-score** measures the balance between precision (how many predicted positives are correct) and recall (how many actual positives are identified). It is the harmonic mean of both, making it ideal for datasets with **imbalanced classes**.

## Which model is better?

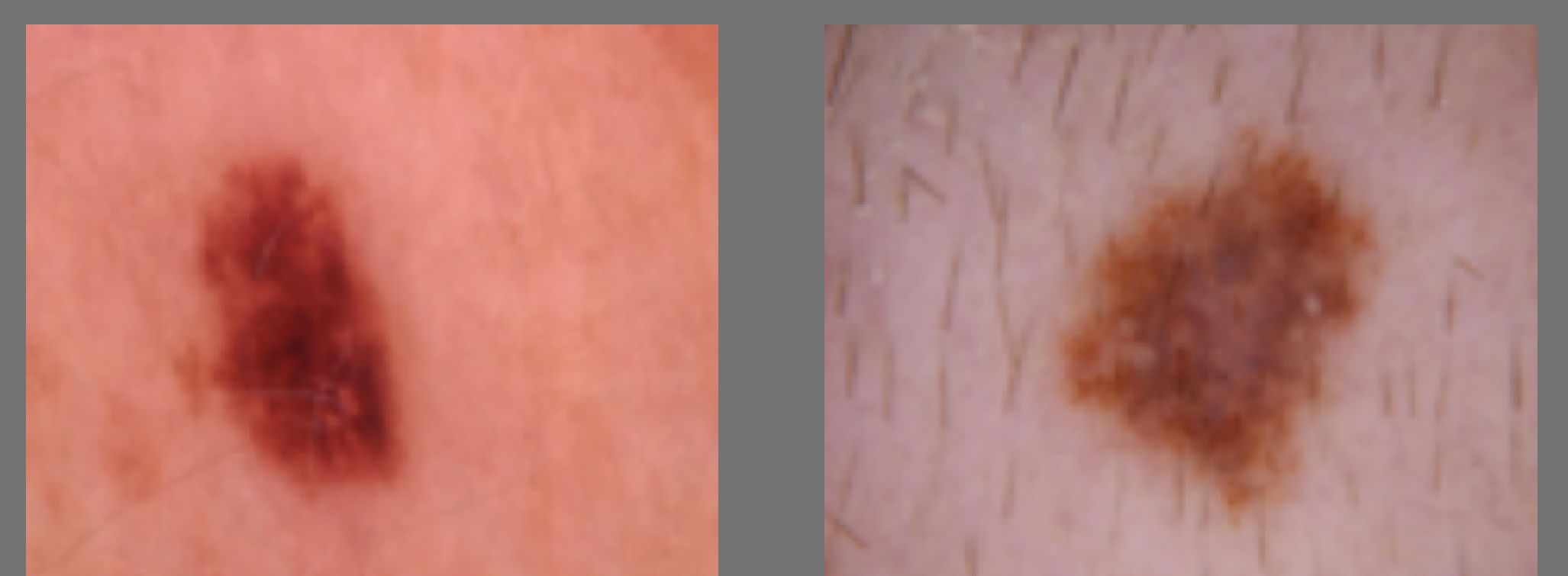


## Diagnosis speed AI vs doctor



**Who is responsible if AI provides an incorrect diagnosis?**

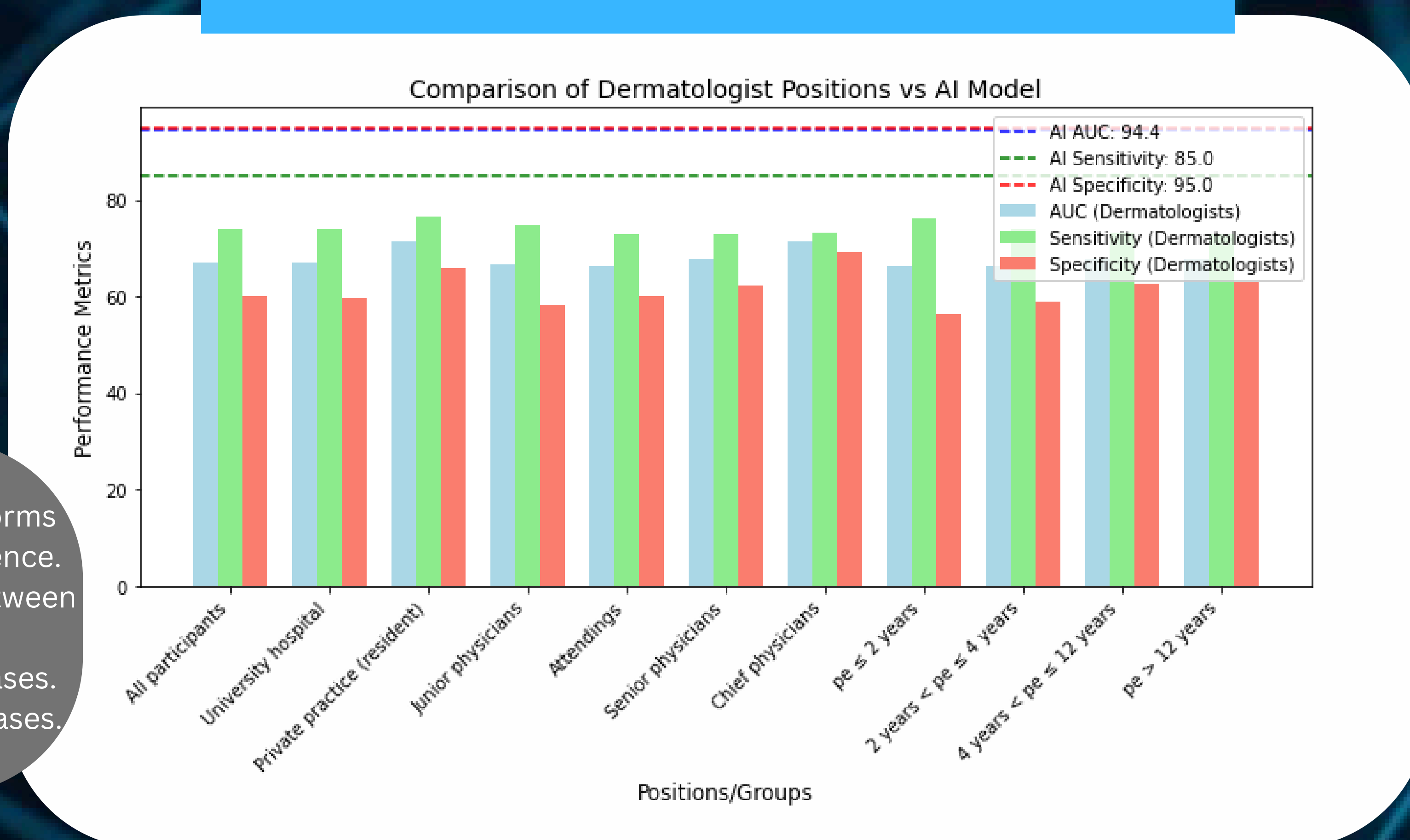
## Can you tell which one is the melanoma?



AI has the potential to achieve more than **98%** accuracy in skin cancer diagnosis within the next 5 years.



## AI vs doctor identifying melanoma



On the right side, you can see a plot showing how AI performs compared to dermatologists with varying levels of experience. **AUC:** A score indicating how well a model **distinguishes** between classes. **Sensitivity:** How well the model identifies **true positive** cases. **Specificity:** How well the model identifies **true negative** cases.

