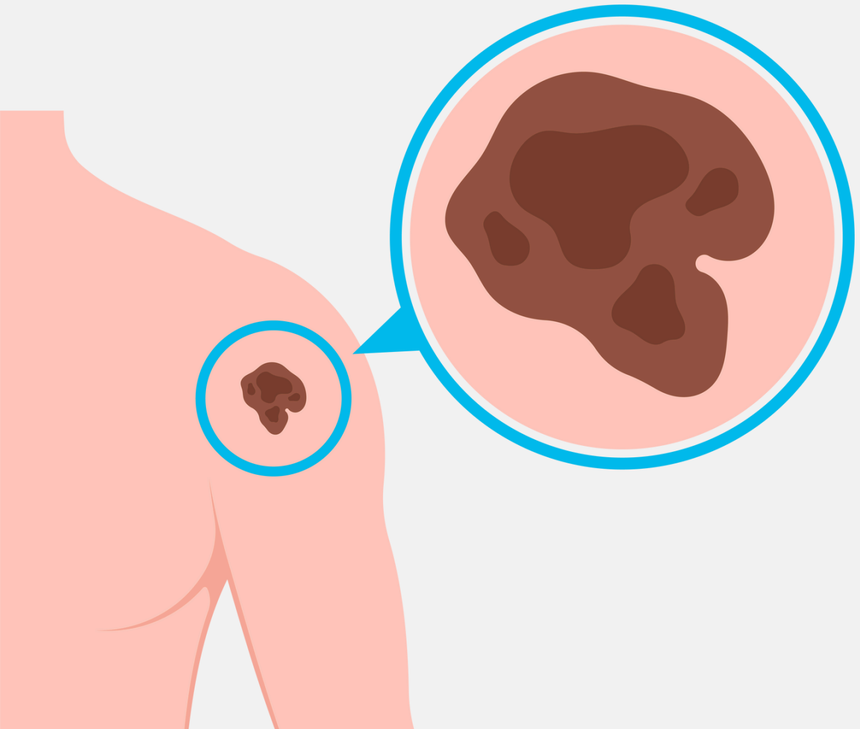
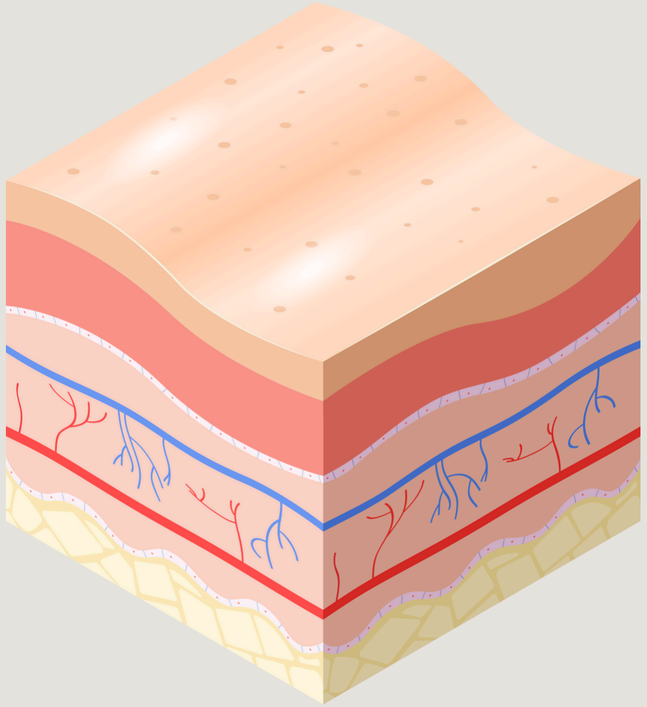
uOttawa

Melanoma Skin Cancer Detection



PRESENTED BY

Steven Wilson



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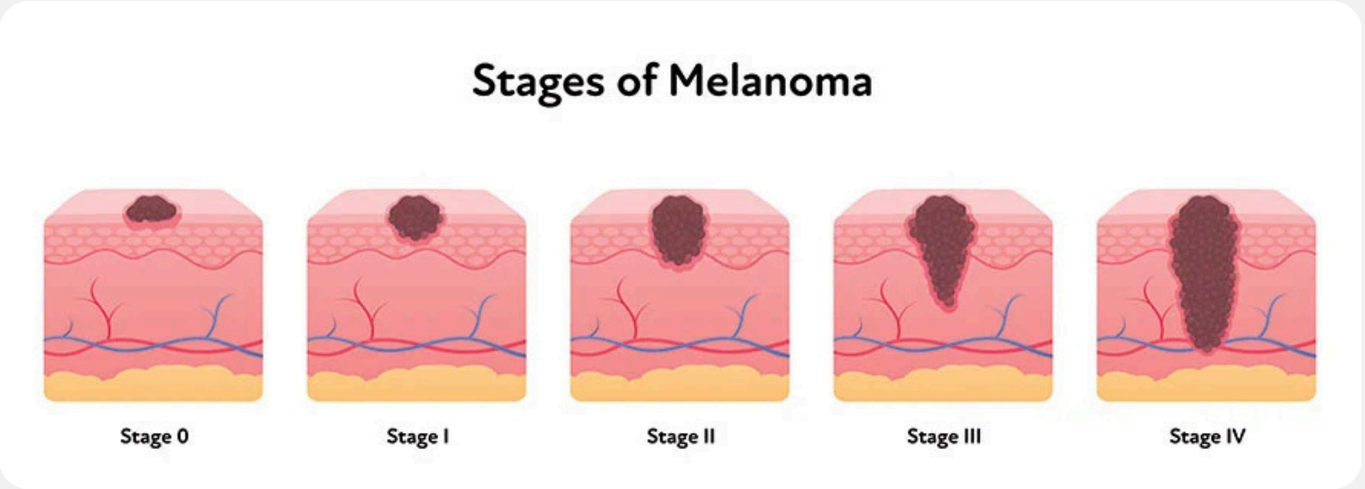
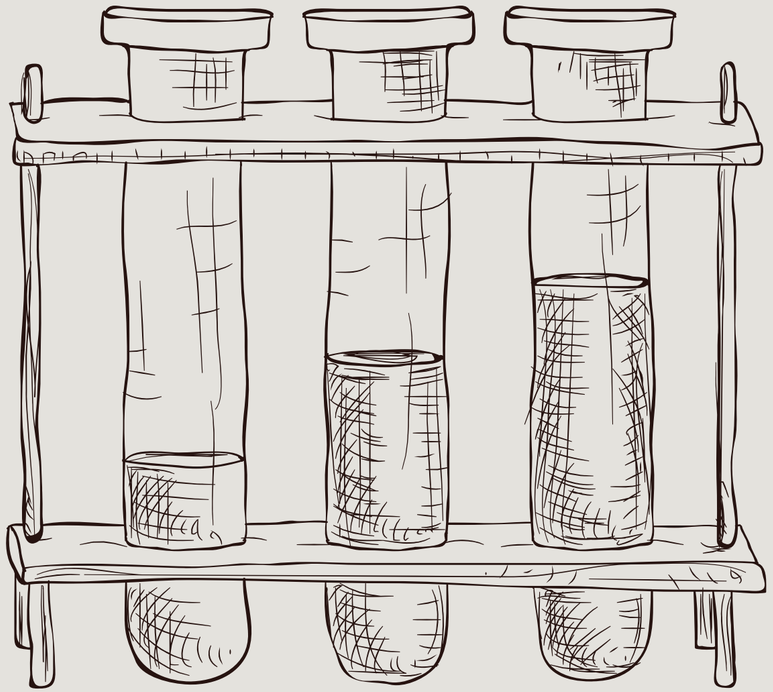
Contextual Background



Melanoma is a type of cancer that starts in the cells that produce melanin. This cancer occurs when a melanocyte grows uncontrollably and turns into a tumor.

Melanoma is **less common** than other types of cancers, however, it is the **most serious** type of skin cancer and is much more likely to spread to other parts of the body if not found and treated.

Understanding the Data

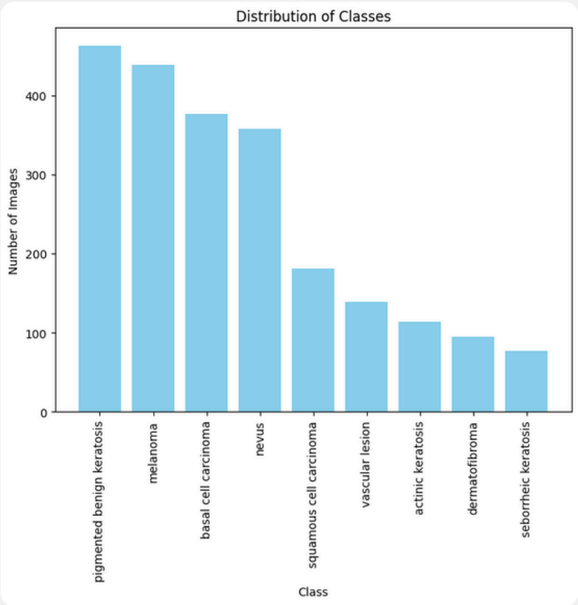


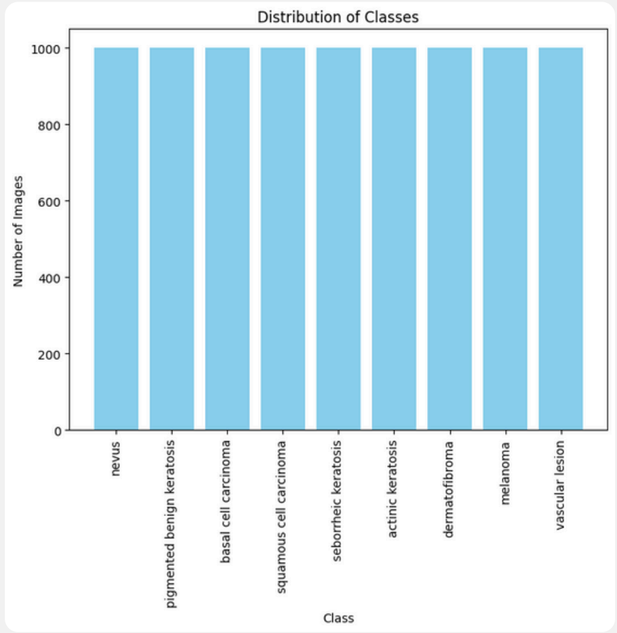
01 The dataset **Skin Cancer ISIC** contains 2,347 images of common and serious skin lesions and cancers.

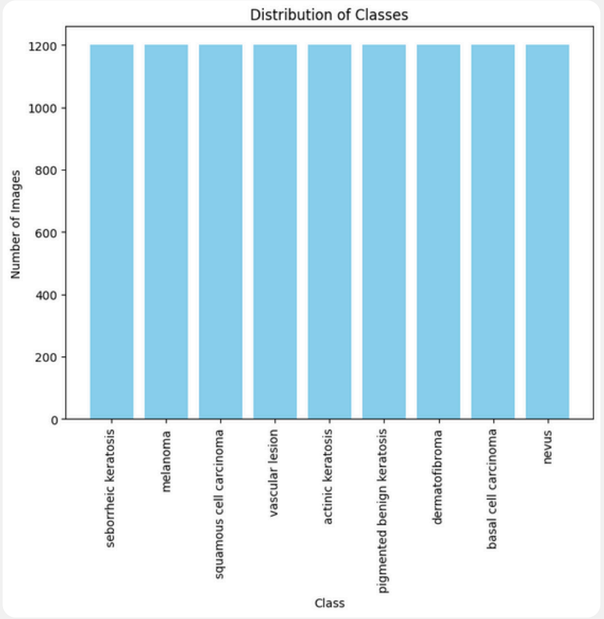
02 The images are **sorted** and classified among **9 categories**.

03 There is a noticeable **class imbalance.** The images are unevenly distributed, with some classes having significantly more samples than others.

Data







Before

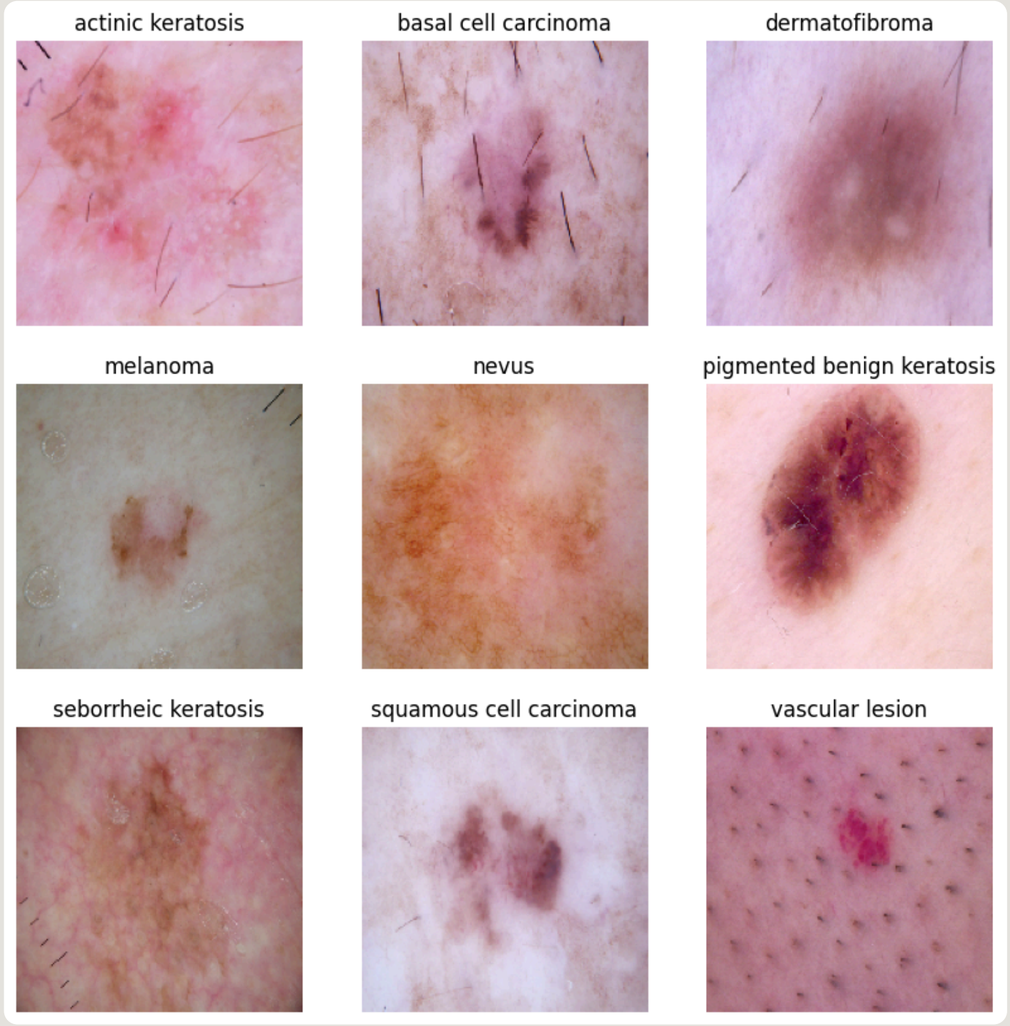
After

9 Classes

This image showcases a **variety of skin lesions** from the **"Skin Cancer ISIC"** dataset, including both malignant and benign types such as melanoma, basal cell carcinoma, and seborrheic keratosis.

Malignant and Benign

Data Sample



Training and Testing

Data Split

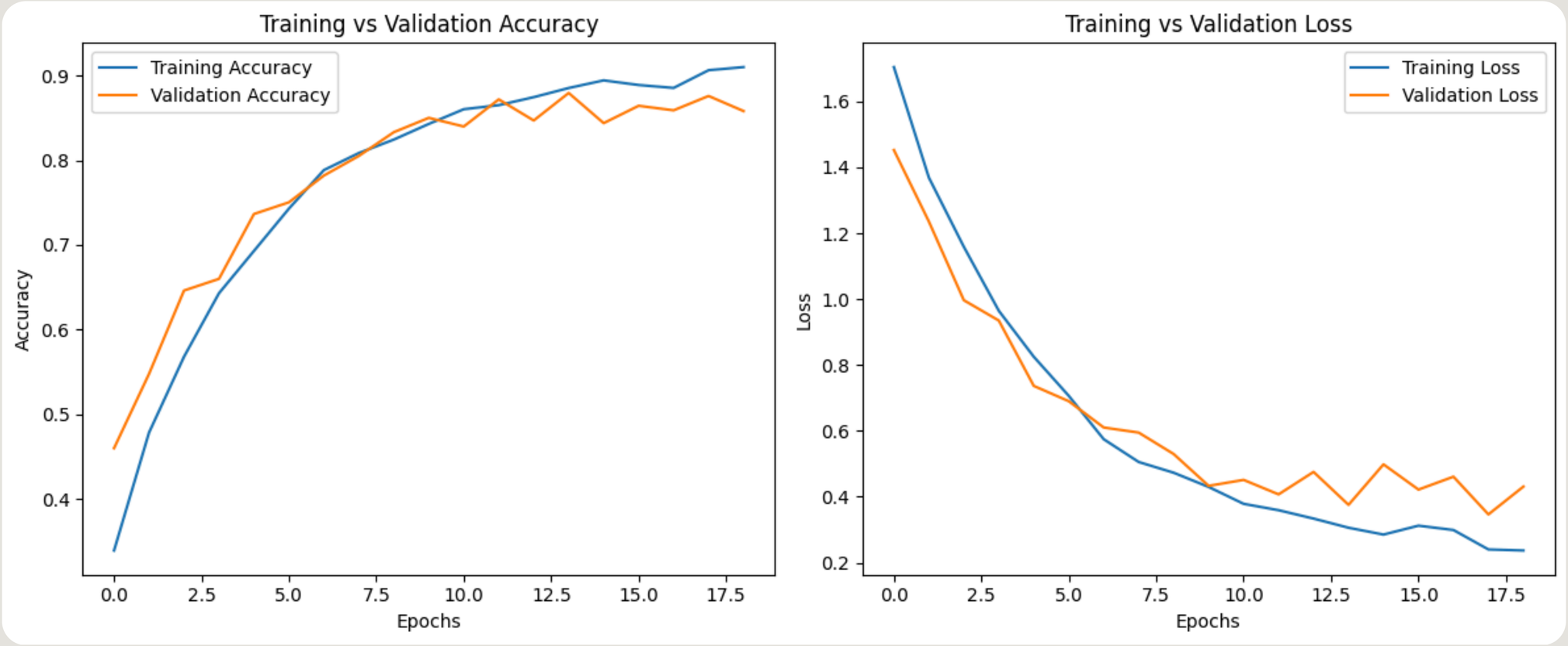
For this project **20%** of the dataset is allocated to the **validation set**, while **80%** is used for **training.**

Convolutional Neural Network

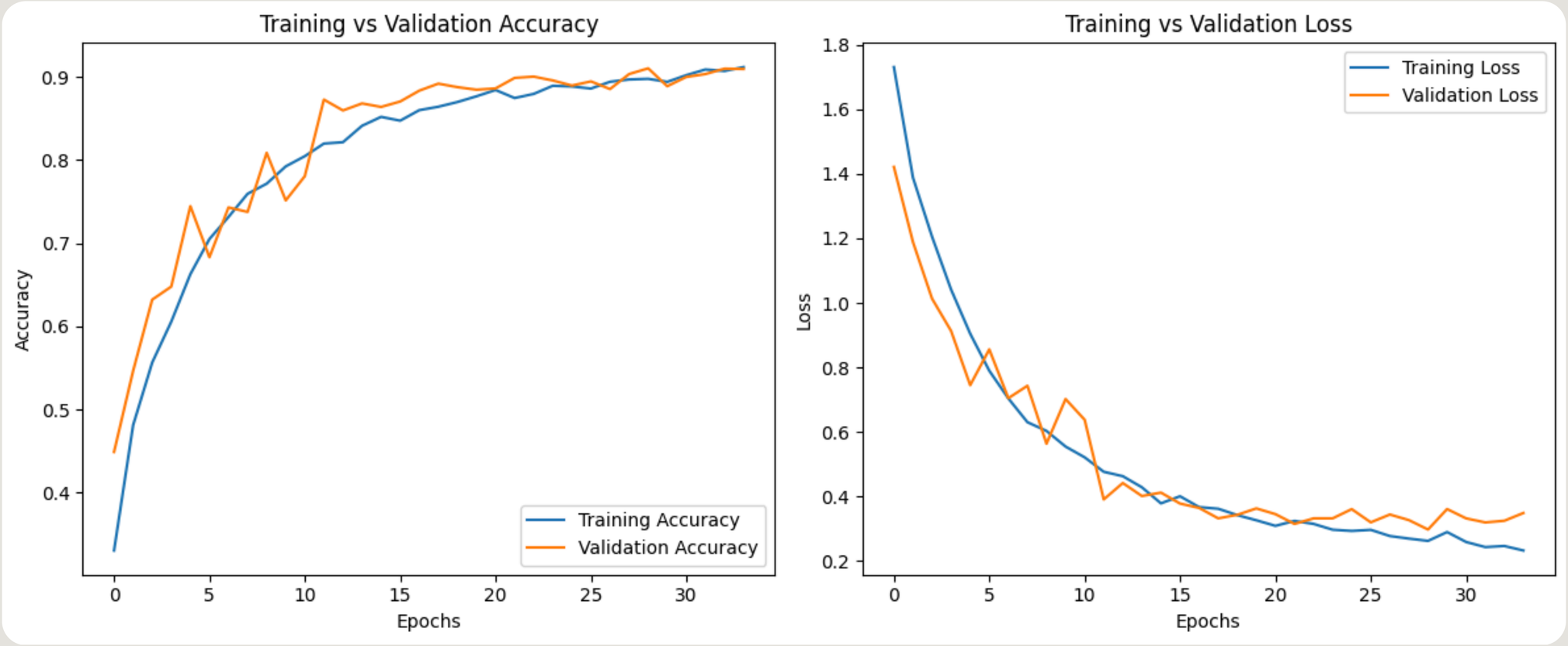
We used a Convolutional Neural Network (CNN) to automatically extract hierarchical features from skin lesion images, classify them into different skin cancer types.

Accuracy and Loss

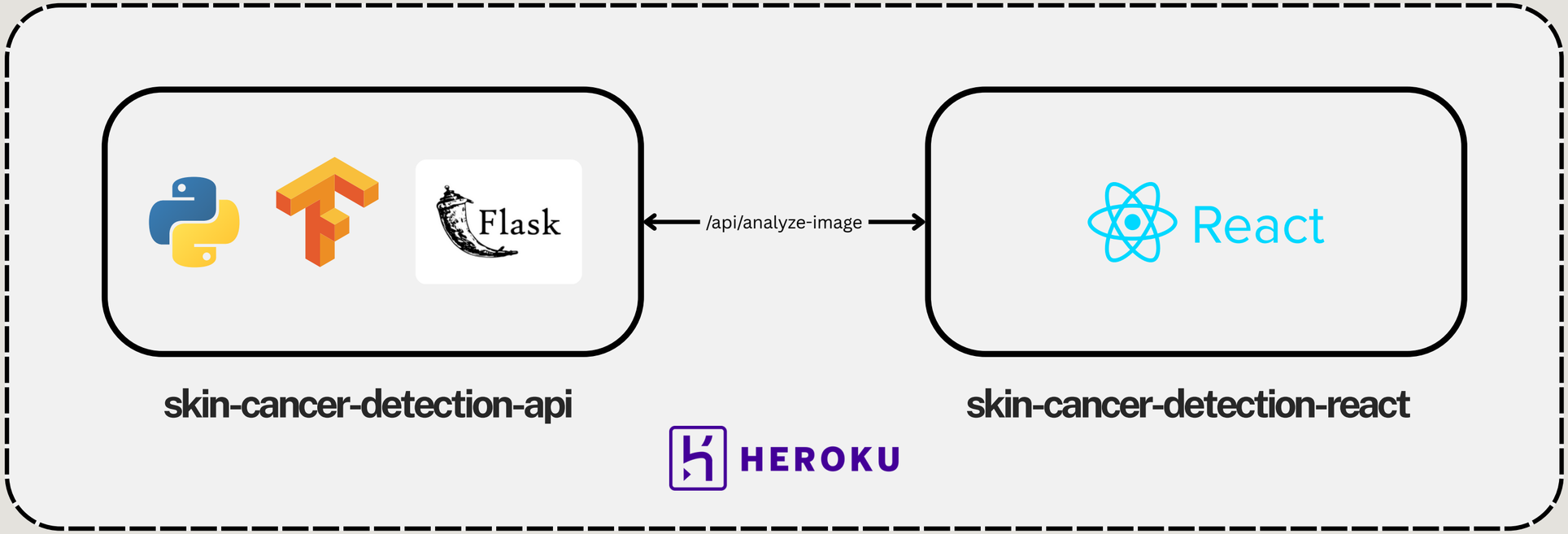
The model is learning well as both accuracy increases and loss decreases, but slight overfitting may be occurring



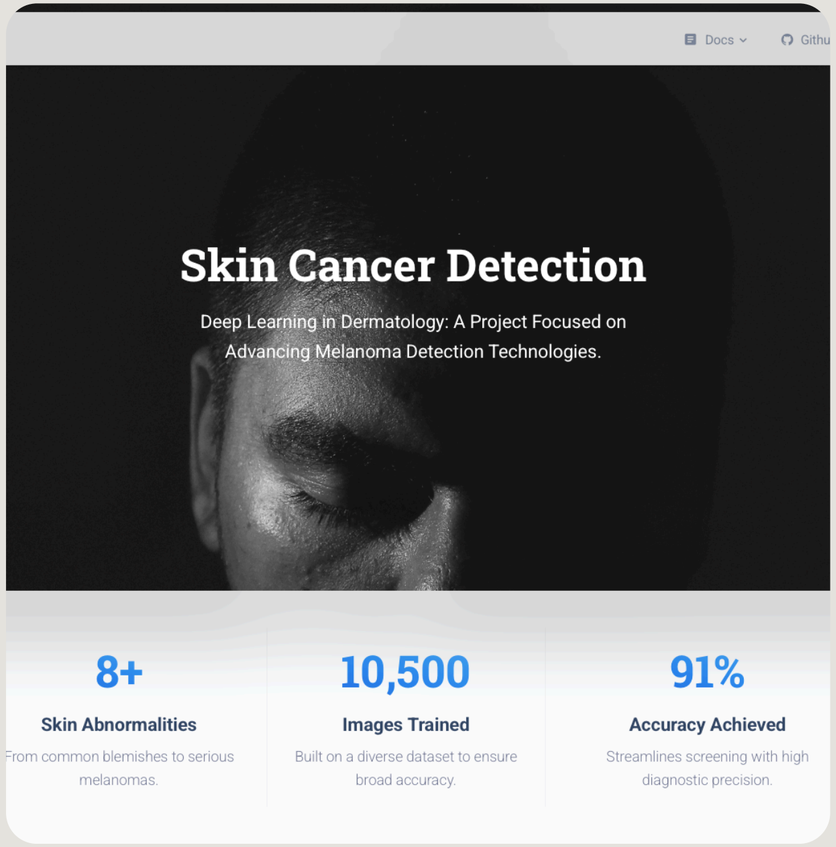
Training vs Validation

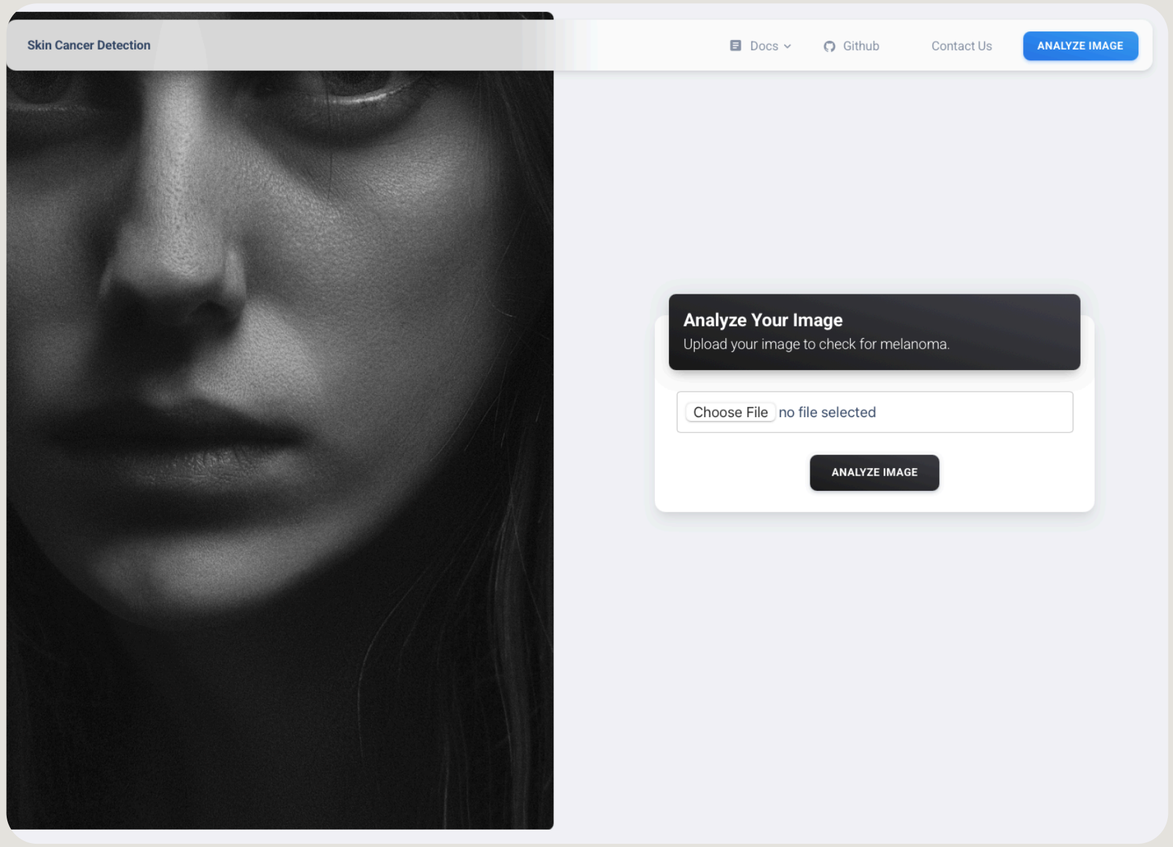


Training vs Validation



Architecture


Docs
Github
Skin Cancer Detection
Deep Learning in Dermatology: A Project Focused on Advancing Melanoma Detection Technologies.
8+
Skin Abnormalities
From common blemishes to serious melanomas.
10,500
Images Trained
Built on a diverse dataset to ensure broad accuracy.
91%
Accuracy Achieved
Streamlines screening with high diagnostic precision.


Skin Cancer Detection
Docs
Github
Contact Us
ANALYZE IMAGE
Analyze Your Image
Upload your image to check for melanoma.
Choose File
no file selected
ANALYZE IMAGE

Results

Discussion & Future Work

Enhance Data Robustness

Expand our database by incorporating a more diverse set of images.

Comprehensive Testing & Evaluation

Incorporating broader evaluation techniques. To better understand model performance under various conditions and edge cases.

Improved Model Reliability

Implementation of rejection mechanisms.

Conclusions

- Our project demonstrates the potential of using convolutional neural networks (CNNs) for early melanoma detection, showcasing promising initial results using the ISIC dataset.
- We learnt the importance of creating a more robust training dataset that includes diverse negative samples and real-world variations.
- Further testing and evaluation beyond traditional validation metrics are necessary to ensure reliability and safety in clinical settings.

Thanks

References

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