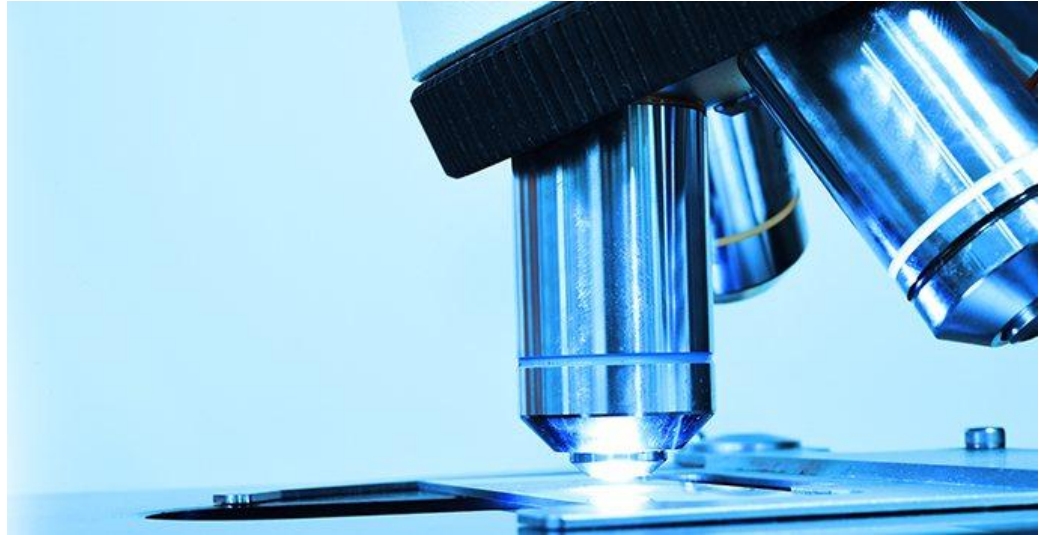# Classifying Dermoscopic Images Using Convolutional Neural Networks

Eric Denbin

Presentation Outline

- Business Understanding
- Purpose Of Analysis
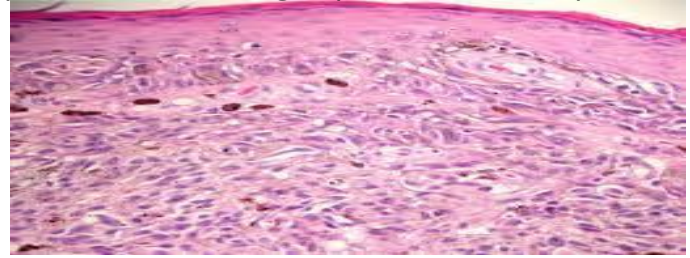- Data & Methods
- Results
- Recommendations
- Future Steps

https://ocskinlab.com/dermatopathology/

Business Understanding

Background:

Skin cancer is the most common cancer in the United States and worldwide

Diagnosis:

Skin lesions are typically diagnosed using clinical methods

If a lesion cannot be diagnosed clinically, or is suspected to be malignant, the specific type of lesion is determined through histopathological analysis of biopsies

Purpose Of Analysis

Predict whether skin lesions in dermoscopic images are benign, malignant, or of unknown risk

Stakeholder: Health-tech startup

Key Metric: Recall & Precision

Benign

Malignant

Unknown
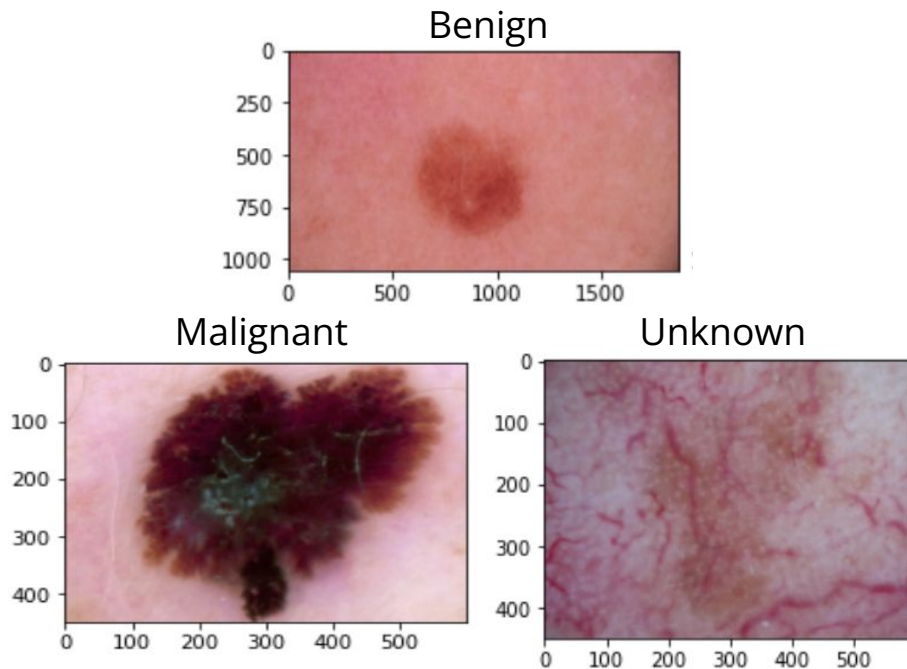
Data & Methods

Data provided by the International Skin Imaging Collaboration archive

Number of Images: 7,179

Class Balance

- **Train**
- **Test**

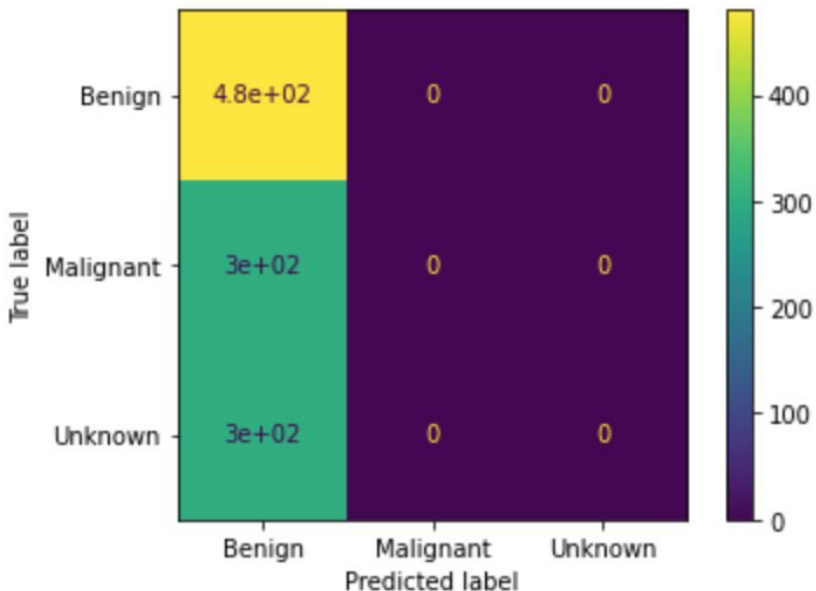Class Distribution in Training Data

Data Examples
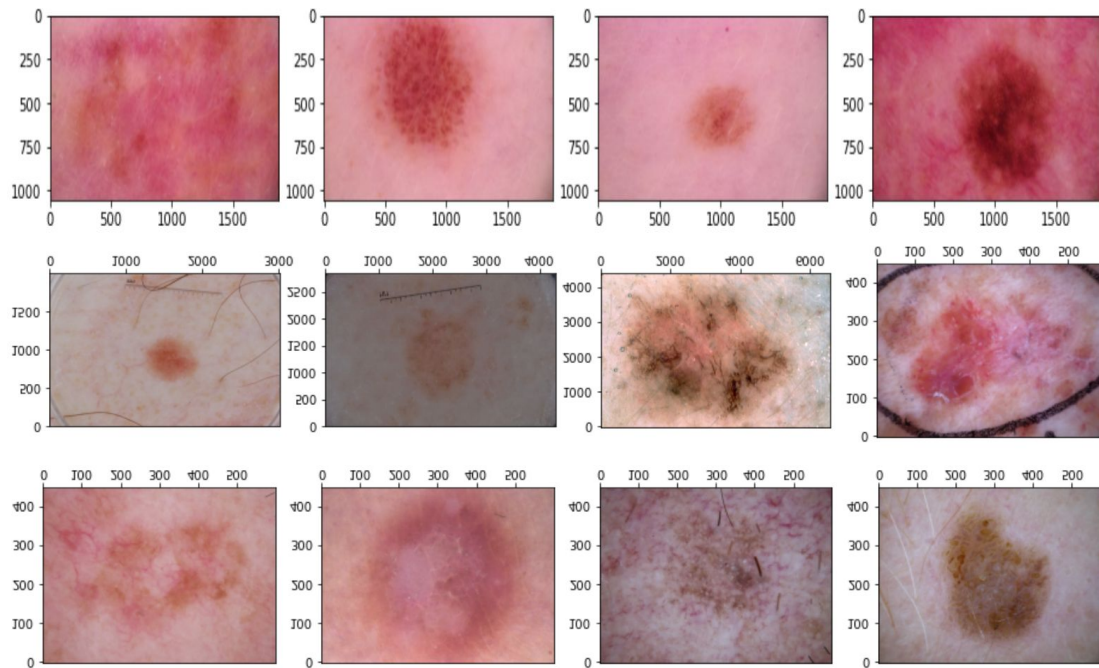
Baseline Model

Fully Connected Dense Neural Network

Validation Accuracy: 44.44%

Validation Recall:

- Benign – 100%
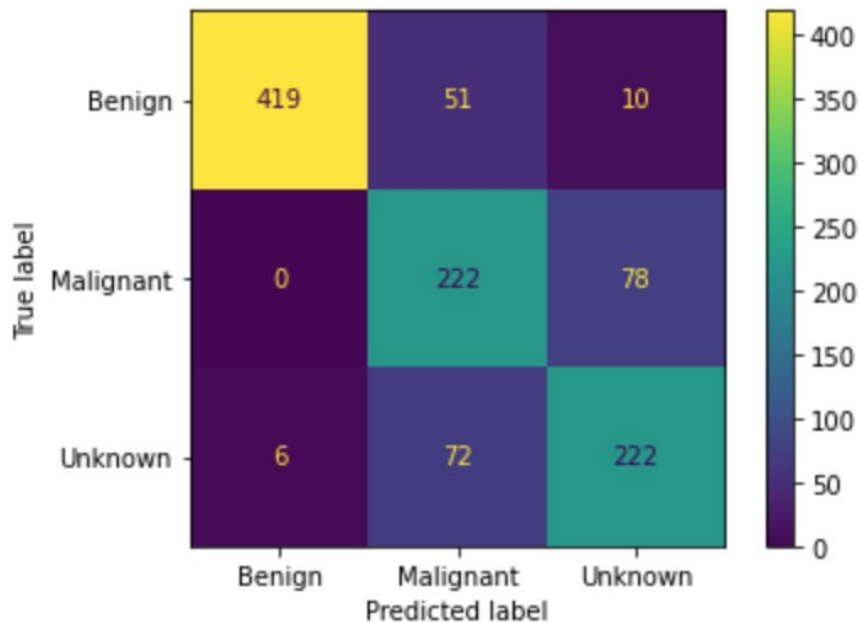- Malignant – 0%
- Unknown – 0%

Final Model

Convolutional Neural Network

- 22 layers
- 25 epochs

Validation Accuracy: 79.91%

Validation Recall:

- Benign – 87.29%
- Malignant – 74%
- Unknown – 74%

Recommendations

This model should be used by medical professionals as part of the clinical diagnosis of skin lesions

This model should be used to reduce the number of biopsies taken for benign lesions

This model should be used to expedite the process of serial imaging, and replace single image expert consensus

Future Steps

Get more dermoscopic images of those skin conditions in the archive that are underrepresented

Train a binary classifier that predicts only benign and malignant lesions

Train a multiclass classifier that predicts specific types of lesions

Thank You

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