

# Mole Detect .app

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<http://moledetect.herokuapp.com>



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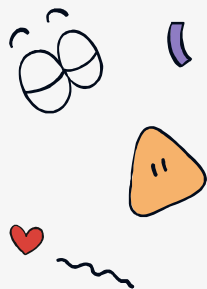
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7 mole types

## 03 Data

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10K images



## 04 Model

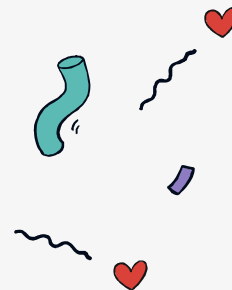
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3 different approaches

## 05 App

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on heroku





# 01-Introduction

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The purpose of the project is to develop a tool that would be able to detect moles that need to be handle by doctors.

The project will be available on a web app where the user could upload a picture of the mole and see the result.

The project will be upload on internet with flask, doker and heroku.

02

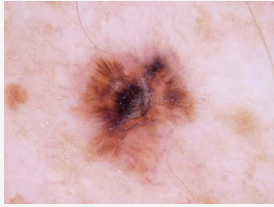
# The moles

There are 7 types of moles



# Mole Types / benign

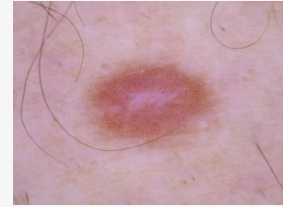
**Actinic keratoses**



**Benign keratoses-like lesions**



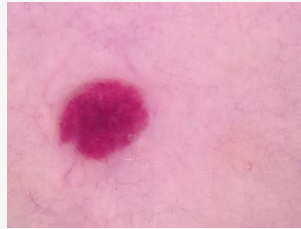
**Dermatofibroma**



**Melanocytic nevi**

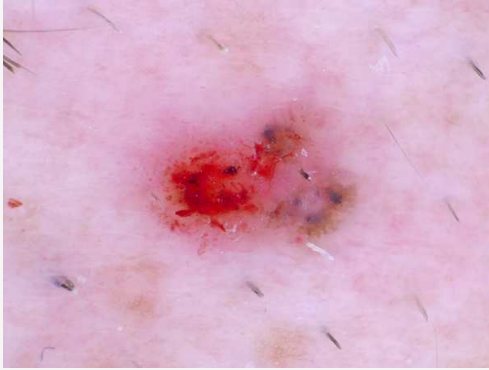


**Vascular lesions**



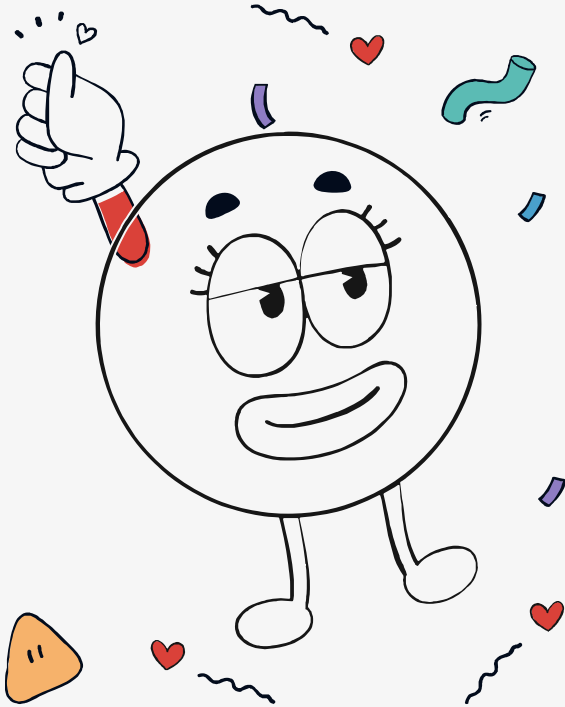
# Mole Types / malignant

**Basal cell carcinoma**



**Melanoma**



	<div data-bbox="1445 303 1748 482">03</div> <div data-bbox="1047 649 1715 744"><h1>The data</h1></div> <div data-bbox="966 813 1719 889"><hr/><p>10k mole images</p></div>
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# Problem with the data



Actinic keratosis (akiec)	327
<b>Basal cell carcinoma (bcc)</b>	514
Benign keratosis-like lesions (bkl)	1.099
Dermatofibroma (df)	115
<b>Melanoma (mel)</b>	1.113
Melanocytic nevi (nv)	6.705
Vascular lesions (vasc)	142



# Review of the data



How to deal with overfitting



## Class Weights

{0: 4.37, 1: 2.78, 2: 1.30,  
3: 12.44, 4: 1.28, 5: 0.21,  
6: 10.07}

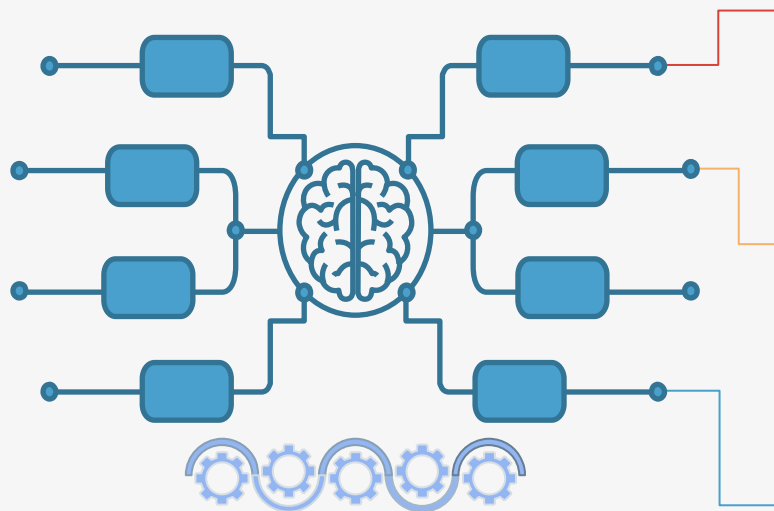
## Resampling

n\_samples=500

## Random Over sampling

RandomOverSampler()

# 04-Model



## learning\_rate

ReduceLROnPlateau (monitor='val\_loss',  
factor=0.1, patience=3)

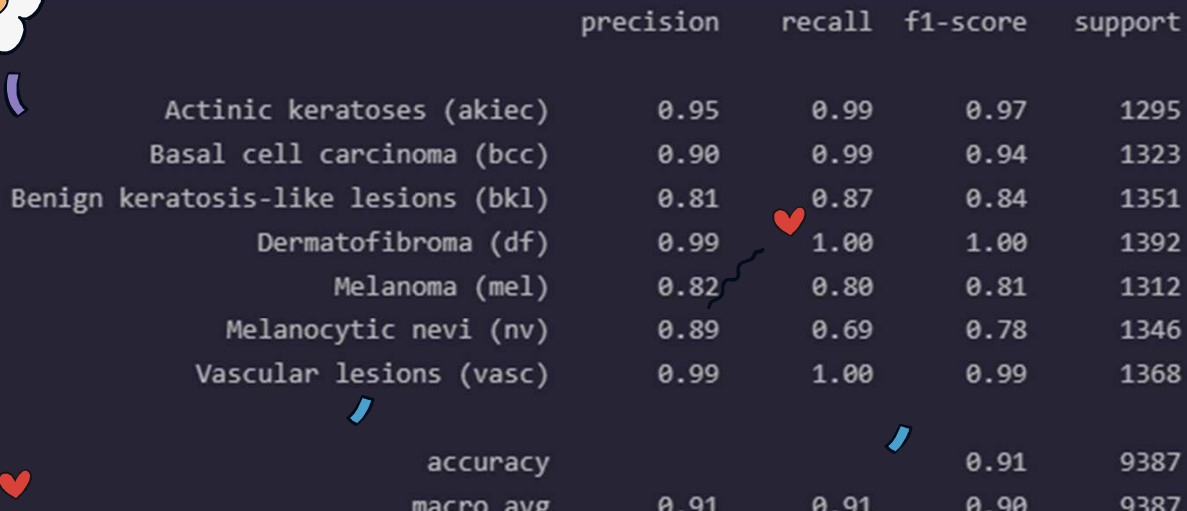
## early\_stop

EarlyStopping(monitor='val\_loss',  
patience=8)

## tensorboard

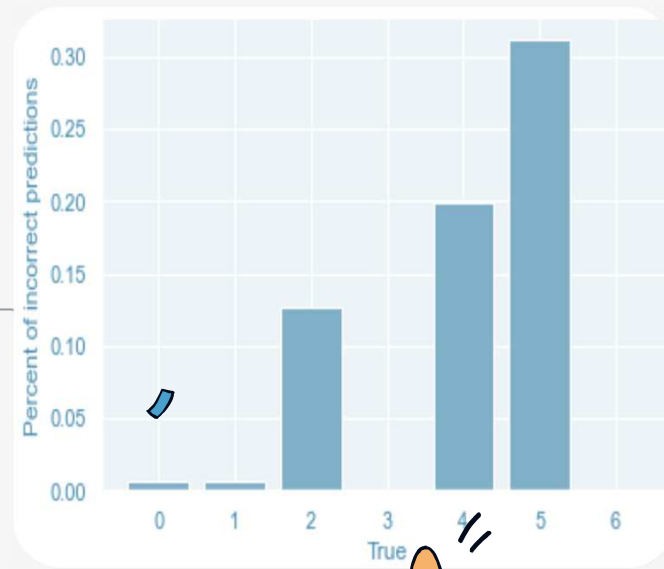
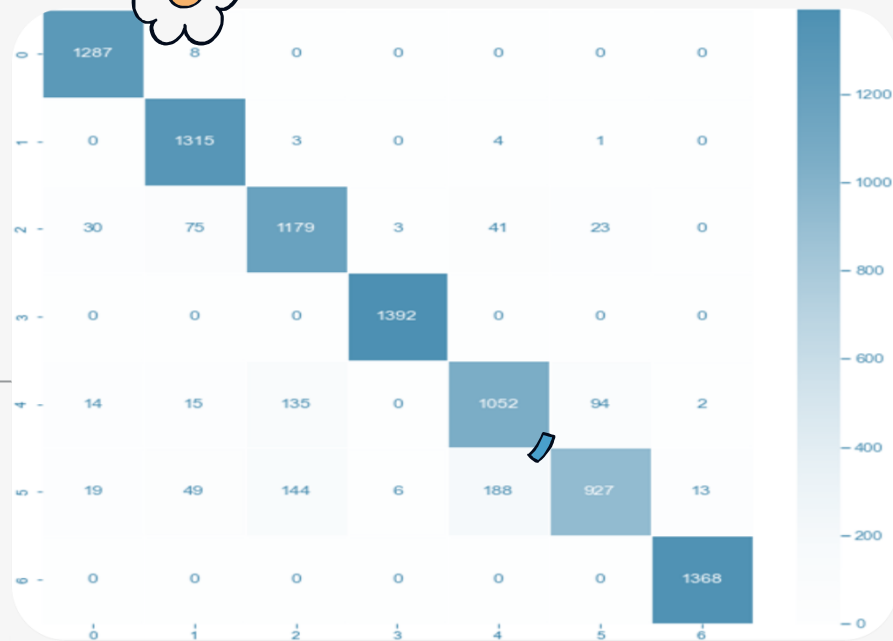
TensorBoard(log\_dir='./logs/{}'.format  
(LOG\_DIR))

# Classification Report



	precision	recall	f1-score	support
Actinic keratoses (akiec)	0.95	0.99	0.97	1295
Basal cell carcinoma (bcc)	0.90	0.99	0.94	1323
Benign keratosis-like lesions (bkl)	0.81	0.87	0.84	1351
Dermatofibroma (df)	0.99	1.00	1.00	1392
Melanoma (mel)	0.82	0.80	0.81	1312
Melanocytic nevi (nv)	0.89	0.69	0.78	1346
Vascular lesions (vasc)	0.99	1.00	0.99	1368
accuracy			0.91	9387
macro avg	0.91	0.91	0.90	9387
weighted avg	0.91	0.91	0.91	9387

# Confusion Matrix



# 05-The App

## Mole Classifier

**Disclaimer: This app is a learning exercise.**

Drop image here or click select button

Submit

Clear

[Repo at Github](#)  
[Baki Guher](#)



# Conclusions

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Some of the images from different classes are very close to each other.

Data imbalance is a big problem, image generation even if it is not advised can be used only in those classes.



# Thanks

Do you have any questions?

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**HAPPY  
MOLE DAY!**