

MALARIA DISEASE DETECTION USING MACHINE LEARNING

**Detecting and Deploying Uninfected and
Parasitized Image Cells.**

Introduction

Malaria is highly prevalent in tropical and subtropical regions, that is life-threatening if measures are not taken early. By analyzing blood pap smears, pathologists can diagnose the pap smears.

This project leverages machine learning to predict whether a pap smear is Parasitized or Uninfected.

This Malaria Image Classification is heavily built using Python Programming Language libraries TensorFlow, and Keras

Project Overview

The presentation will focus on three major core steps in building the model, which involved splitting the data into three partitions in the ratio of 60%:20%:20% respectively

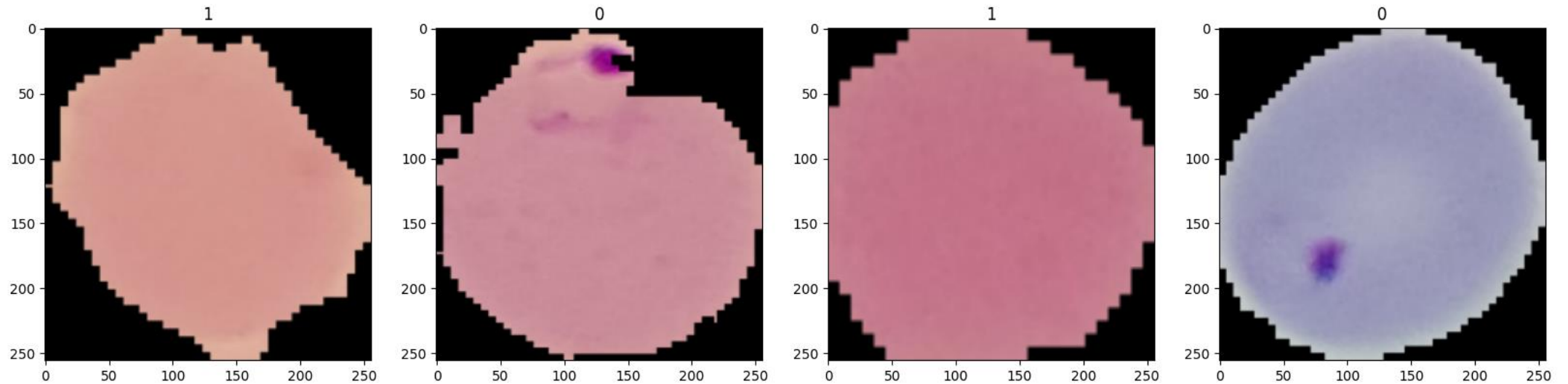
1. Training Set Data – For training the deploying model
2. Validation Data – For evaluating the model
3. Test Size – Will be used post-training the data

The subsequent slides are a brief overview/summary of the model itself.

Pap Smear Labelling

Once I loaded the images, my aim was to classify them as a zero or one binary classification

Class 1 represents Uninfected Pap Smear Images and Class 0 represents Parasitized



1. Training the Data

Training the data

```
[30] ✓ 0.0s Python
logdir='logs'

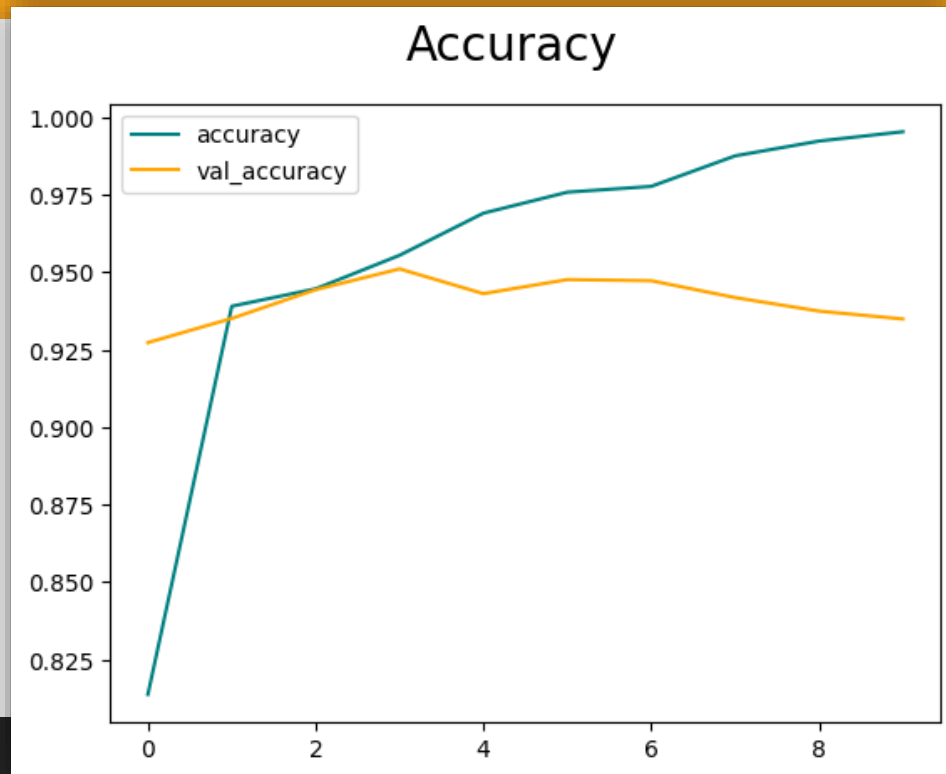
[31] ✓ 0.0s Python
tensorboard_callback=tf.keras.callbacks.TensorBoard(log_dir=logdir)

[33] ✓ 79m 48.8s Python
#The deep model training
hist=model.fit(train, epochs=10, validation_data=val, callbacks=[tensorboard_callback])

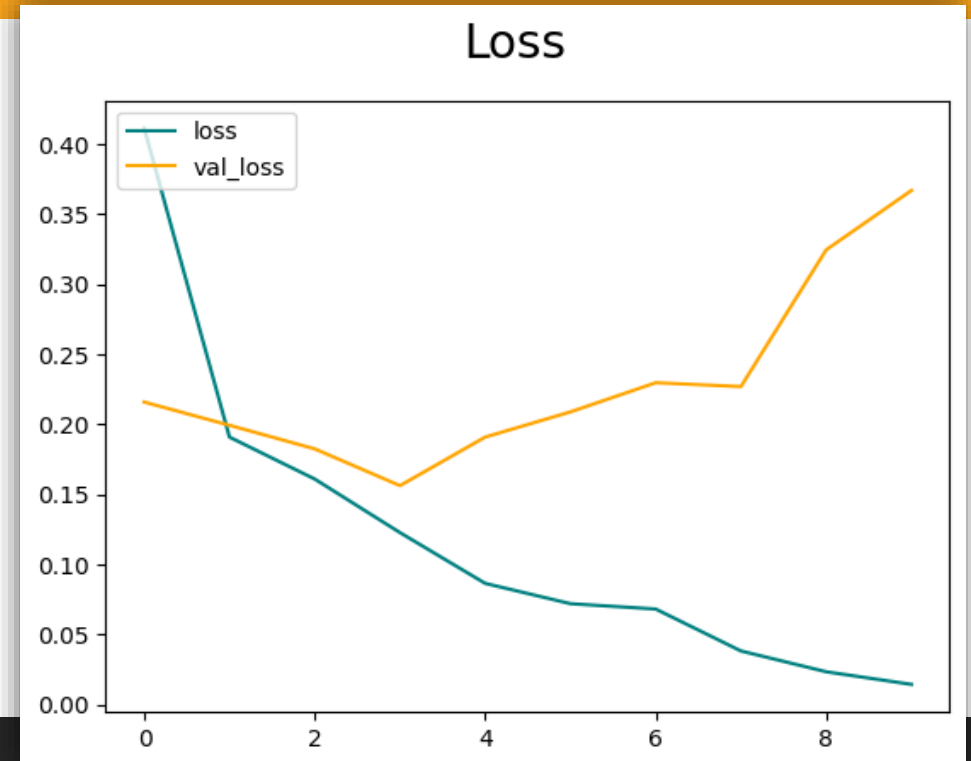
... Epoch 1/10
517/517 ————— 402s 753ms/step - accuracy: 0.6919 - loss: 0.5819 - val_accuracy
Epoch 2/10
```

2. Validating the Model: Accuracy and Loss Metrics

ACCURACY METRICS



LOSS METRICS



3. Testing the data, whether it is Uninfected or Parasitized.

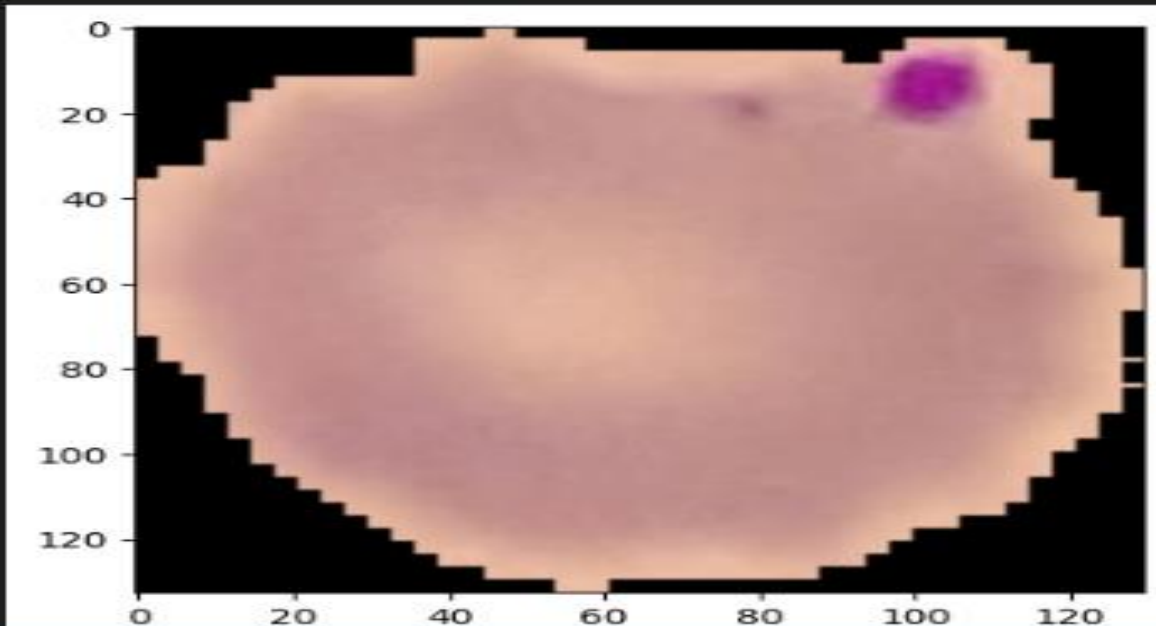
Testing the data

```
img = cv2.imread(r'C:\Users\PC\Documents\Data-Science-Tasks\Malaria-ImageClassification\mo  
plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))  
plt.show()
```

[68]

✓ 1.0s

Python



The Model can successfully predict the pap smear is Parasitized

```
#Predict whether a pap smear is Uninfected or Parasitized.
#1.=Uninfected and 0.=Parasitized
yhat=model.predict(np.expand_dims(resize_image/255,-0))
yhat
```

[71] ✓ 0.6s Open 'yhat' in Data Wrangler Python

... 1/1 0s 451ms/step

... array([[1.5942851e-18]], dtype=Float32)

```
if yhat>0.5:
    print(f'Predicted class is Uninfected')
else:
    print(f'Predicted class is Parasitized')
```

[72] ✓ 0.0s Python

... Predicted class is Parasitized

Conclusion

There is a case of overfitting, and the mitigation strategy I took is early-stopping

The Model can predict whether a pap smear is Uninfected or Parasitized.

Thank you

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Medium Account: <https://medium.com/@oliviaayora>

GitHub Project: <https://github.com/254Bit/Malaria-ImageClassification>