# import libary

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

import os

import PIL

import tensorflow as tf

from tensorflow import keras

from tensorflow.keras import layers

from tensorflow.keras.models import Sequential

from sklearn.metrics import classification\_report

import pathlib

# list of sub directory(class)

class\_names = []

for x in os.walk(dataset\_path):

sub\_dir = x[0]

sub\_dir\_list = str(sub\_dir).split('/')

if len(sub\_dir\_list) > 4:

x\_class = (sub\_dir\_list[-1])

class\_names.append(x\_class)

print(class\_names)

['white spot', 'Anthracnose', 'healthy', 'bird eye spot', 'brown blight', 'red leaf spot', 'gray light', 'algal leaf']

# print total number of images in the dataset

for class\_i in class\_names:

image\_count = len(list(dataset\_dir.glob(f'{class\_i}/\*.jpg')))

print(f"Images in class {class\_i}:",image\_count)

Images in class white spot: 142

Images in class Anthracnose: 100

Images in class healthy: 74

Images in class bird eye spot: 100

Images in class brown blight: 113

Images in class red leaf spot: 143

Images in class gray light: 100

Images in class algal leaf: 113

# Parameter setting

train\_batch = 128

val\_batch = 128

img\_height = 224

img\_width = 224

IMG\_SIZE = (img\_height, img\_width)

val\_split = 0.2

# Load data for Training

train\_ds = tf.keras.utils.image\_dataset\_from\_directory(dataset\_dir,

validation\_split=val\_split,

subset="training",

seed=123,

image\_size=(img\_height, img\_width),

batch\_size=train\_batch

)

Found 885 files belonging to 8 classes.

Using 708 files for training.

2022-07-07 02:00:35.718624: I tensorflow/stream\_executor/cuda/cuda\_gpu\_executor.cc:937] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero

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To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.

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2022-07-07 02:00:35.903718: I tensorflow/stream\_executor/cuda/cuda\_gpu\_executor.cc:937] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero

2022-07-07 02:00:35.904737: I tensorflow/stream\_executor/cuda/cuda\_gpu\_executor.cc:937] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero

2022-07-07 02:00:35.905732: I tensorflow/stream\_executor/cuda/cuda\_gpu\_executor.cc:937] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero

2022-07-07 02:00:38.387029: I tensorflow/stream\_executor/cuda/cuda\_gpu\_executor.cc:937] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero

2022-07-07 02:00:38.388149: I tensorflow/stream\_executor/cuda/cuda\_gpu\_executor.cc:937] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero

2022-07-07 02:00:38.388891: I tensorflow/stream\_executor/cuda/cuda\_gpu\_executor.cc:937] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero

2022-07-07 02:00:38.389546: I tensorflow/core/common\_runtime/gpu/gpu\_device.cc:1510] Created device /job:localhost/replica:0/task:0/device:GPU:0 with 15403 MB memory: -> device: 0, name: Tesla P100-PCIE-16GB, pci bus id: 0000:00:04.0, compute capability: 6.0

# Load data for Validation

val\_ds = tf.keras.utils.image\_dataset\_from\_directory(dataset\_dir,

validation\_split=val\_split,

subset="validation",

seed=123,

image\_size=(img\_height, img\_width),

batch\_size=val\_batch

)

Found 885 files belonging to 8 classes.

Using 177 files for validation.

class\_names = train\_ds.class\_names

print(class\_names)

num\_classes=len(class\_names)

['Anthracnose', 'algal leaf', 'bird eye spot', 'brown blight', 'gray light', 'healthy', 'red leaf spot', 'white spot']

# Review dataset sample

plt.figure(figsize=(10, 10))

for images, labels in train\_ds.take(1):

for i in range(9):

ax = plt.subplot(3, 3, i + 1)

plt.imshow(images[i].numpy().astype("uint8"))

plt.title(class\_names[labels[i]])

plt.axis("off")

2022-07-07 02:00:39.043311: I tensorflow/compiler/mlir/mlir\_graph\_optimization\_pass.cc:185] None of the MLIR Optimization Passes are enabled (registered 2)

2022-07-07 02:00:49.110464: I tensorflow/core/kernels/data/shuffle\_dataset\_op.cc:175] Filling up shuffle buffer (this may take a while): 319 of 1024

2022-07-07 02:00:59.084416: I tensorflow/core/kernels/data/shuffle\_dataset\_op.cc:175] Filling up shuffle buffer (this may take a while): 608 of 1024

2022-07-07 02:01:01.749039: I tensorflow/core/kernels/data/shuffle\_dataset\_op.cc:228] Shuffle buffer filled