DL 3 plant disease

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import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder
from sklearn.metrics import accuracy_score
import tensorflow as tf
from tensorflow.keras import Sequential
from tensorflow.keras.layers import Conv2D, MaxPooling2D, Flatten, Dense
from tensorflow.keras.preprocessing.image import load_img, img_to_array

# Load the dataset from CSV
df = pd.read_csv('plant_disease_data.csv')

# Preprocessing images and labels
img_size = (100, 100)  # Define image size
X = []  # Initialize list to store preprocessed images
y = df['label']  # Extract labels
encoder = LabelEncoder()
y = encoder.fit_transform(y)  # Encode labels

for img_path in df['image_path']:
    # Load image, resize, and convert to array
    img = load_img(img_path, target_size=img_size)
    img_array = img_to_array(img)
    # Normalize pixel values
    img_array /= 255.0
    X.append(img_array)

X = np.array(X)

# Split data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)

# Build the CNN model
model = Sequential([
    Conv2D(32, (3, 3), activation='relu', input_shape=(img_size[0], img_size[1],
3)),
    MaxPooling2D((2, 2)),
    Conv2D(64, (3, 3), activation='relu'),
    MaxPooling2D((2, 2)),
    Conv2D(64, (3, 3), activation='relu'),
    Flatten(),
    Dense(64, activation='relu'),
    Dense(1, activation='sigmoid')
])

# Compile the model
model.compile(optimizer='adam', loss='binary_crossentropy',
metrics=['accuracy'])
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# Train the model
model.fit(X_train, y_train, epochs=5, batch_size=32, verbose=1)

# Evaluate the model
test_loss, test_acc = model.evaluate(X_test, y_test)
print("Test Accuracy:", test_acc)
```