from keras.models import Sequential

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| **TEAM ID** | PNT2022TMID12053 |
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| **PROJECT NAME** | Intelligent Vehicle Damage Assessment and Cost Estimator for Insurance Companies |
| **TEAM MEMBERS** | Aravintan.T  Diwahar.S.J  Sharan.s  Sneha.Y |

from keras.layers import Convolution2D from keras.layers import MaxPooling2D from keras.layers import Flatten

from keras.layers import Dense

from keras.models import model\_from\_json import matplotlib.pyplot as plt

import warnings warnings.filterwarnings('ignore') batch\_size = 32

from tensorflow.keras.preprocessing.image import ImageDataGenerator

# All images will be rescaled by 1./255 train\_datagen = ImageDataGenerator(rescale=1/255)

# Flow training images in batches of 128 using train\_datagen generator train\_generator = train\_datagen.flow\_from\_directory(

'body', # This is the source directory for training images target\_size=(200, 200), # All images will be resized to 200 x

200

labels

batch\_size=batch\_size,

# Specify the classes explicitly

classes = ['00-front','01-rear','02-side'],

# Since we use categorical\_crossentropy loss, we need categorical class\_mode='categorical')

import tensorflow as tf #cnn Model

model = tf.keras.models.Sequential([

# Note the input shape is the desired size of the image 200x 200 with

3 bytes color

# The first convolution

tf.keras.layers.Conv2D(16, (3,3), activation='relu',

input\_shape=(200, 200, 3)),

tf.keras.layers.MaxPooling2D(2, 2), # The second convolution

tf.keras.layers.Conv2D(32, (3,3), activation='relu'),

tf.keras.layers.MaxPooling2D(2,2), # The third convolution

tf.keras.layers.Conv2D(64, (3,3), activation='relu'), tf.keras.layers.MaxPooling2D(2,2),

# The fourth convolution

tf.keras.layers.Conv2D(64, (3,3), activation='relu'), tf.keras.layers.MaxPooling2D(2,2),

# The fifth convolution

tf.keras.layers.Conv2D(64, (3,3), activation='relu'), tf.keras.layers.MaxPooling2D(2,2),

# Flatten the results to feed into a dense layer tf.keras.layers.Flatten(),

# 128 neuron in the fully-connected layer tf.keras.layers.Dense(128, activation='relu'),

# 5 output neurons for 5 classes with the softmax activation tf.keras.layers.Dense(3, activation='softmax')

])

model.summary()

from tensorflow.keras.optimizers import RMSprop

early = tf.keras.callbacks.EarlyStopping(monitor='val\_loss',patience=5) model.compile(loss='categorical\_crossentropy',

optimizer=RMSprop(lr=0.001), metrics=['accuracy'])

total\_sample=train\_generator.n

n\_epochs = 20

history = model.fit\_generator( train\_generator,

steps\_per\_epoch=int(total\_sample/batch\_size), epochs=n\_epochs,

verbose=1)

model.save('body.h5')

acc = history.history['accuracy']

loss = history.history['loss']

epochs = range(1, len(acc) + 1)

# Train and validation accuracy plt.plot(epochs, acc, 'b', label=' accurarcy')

plt.title(' accurarcy') plt.legend()

plt.figure()

# Train and validation loss plt.plot(epochs, loss, 'b', label=' loss') plt.title(' loss')

plt.legend() plt.show()