# CONVOLUTIONAL 1

model = Sequential()

model.add(Conv2D(64,kernel\_size=3, activation='relu', input\_shape=(224, 224, 3)))

model.add(Conv2D(32,kernel\_size=3, activation='relu'))

model.add(Flatten())

model.add(Dense(len(categories)))

model.add(BatchNormalization())

model.add(Activation('softmax'))

from keras.optimizers import SGD

opt = SGD(learning\_rate=0.01, momentum=0.9, nesterov=False, name="SGD")

model.compile(optimizer=opt, loss='categorical\_crossentropy', metrics=['accuracy'])

batch 16

epochs 10

Imagen que contiene teclado

Descripción generada automáticamente

Mean Accuracy: 22.103%

Mean Recall: 33.185%

Mean Precision: 19.407%

> CARGO\_PLANE: Recall: 55.556% Precision: 21.097% Specificity: 99.644% Dice: 30.581%

> HELICOPTER: Recall: 22.727% Precision: 5.882% Specificity: 99.848% Dice: 9.346%

> SMALL\_CAR: Recall: 27.791% Precision: 94.584% Specificity: 99.272% Dice: 42.959%

> BUS: Recall: 21.596% Precision: 4.984% Specificity: 96.642% Dice: 8.099%

> TRUCK: Recall: 10.458% Precision: 5.473% Specificity: 94.526% Dice: 7.186%

> MOTORBOAT: Recall: 3.879% Precision: 0.700% Specificity: 97.567% Dice: 1.187%

> FISHING\_VESSEL: Recall: 73.016% Precision: 0.608% Specificity: 85.708% Dice: 1.206%

> DUMP\_TRUCK: Recall: 25.000% Precision: 1.763% Specificity: 96.818% Dice: 3.293%

> EXCAVATOR: Recall: 62.857% Precision: 8.627% Specificity: 98.226% Dice: 15.172%

> BUILDING: Recall: 19.406% Precision: 88.001% Specificity: 95.494% Dice: 31.799%

> STORAGE\_TANK: Recall: 41.600% Precision: 0.996% Specificity: 80.274% Dice: 1.945%

> SHIPPING\_CONTAINER: Recall: 34.328% Precision: 0.172% Specificity: 74.662% Dice: 0.343%

# CONVOLUTIONAL 2

model = Sequential([

Conv2D(8, 3, input\_shape=(224, 224, 3)),

MaxPooling2D(2=pool\_size),

Conv2D(8, 3),

MaxPooling2D(pool\_size=2),

Flatten(),

Dense(len(categories)),

BatchNormalization(),

Activation("softmax"),

])

opt = SGD(learning\_rate=0.01, momentum=0.9, nesterov=False, name="SGD")

model.compile(optimizer=opt, loss='categorical\_crossentropy', metrics=['accuracy'])

batch=8

epochs=20

Imagen que contiene Calendario

Descripción generada automáticamente

Mean Accuracy: 29.424%

Mean Recall: 34.052%

Mean Precision: 19.987%

> CARGO\_PLANE: Recall: 62.222% Precision: 22.490% Specificity: 99.633% Dice: 33.038%

> HELICOPTER: Recall: 4.545% Precision: 6.250% Specificity: 99.972% Dice: 5.263%

> SMALL\_CAR: Recall: 28.838% Precision: 95.054% Specificity: 99.314% Dice: 44.250%

> BUS: Recall: 41.080% Precision: 7.865% Specificity: 96.076% Dice: 13.203%

> TRUCK: Recall: 2.453% Precision: 7.950% Specificity: 99.139% Dice: 3.749%

> MOTORBOAT: Recall: 3.017% Precision: 0.830% Specificity: 98.406% Dice: 1.302%

> FISHING\_VESSEL: Recall: 80.952% Precision: 0.331% Specificity: 70.843% Dice: 0.660%

> DUMP\_TRUCK: Recall: 62.500% Precision: 0.896% Specificity: 84.205% Dice: 1.766%

> EXCAVATOR: Recall: 59.286% Precision: 3.319% Specificity: 95.397% Dice: 6.285%

> BUILDING: Recall: 30.635% Precision: 93.394% Specificity: 96.310% Dice: 46.136%

> STORAGE\_TANK: Recall: 31.600% Precision: 1.349% Specificity: 88.981% Dice: 2.588%

> SHIPPING\_CONTAINER: Recall: 1.493% Precision: 0.119% Specificity: 98.409% Dice: 0.221%

# CONVOLUTION 3

model = Sequential([

Conv2D(num\_filters, 1, input\_shape=(224, 224, 3),strides=2,padding='same',activation='relu',),

Conv2D(num\_filters, filter\_size, strides=4,padding='same',activation='relu',),

Flatten(),

Dense(256),

BatchNormalization(),

Activation("relu"),

Dense(128),

BatchNormalization(),

Activation("relu"),

Dense(64),

BatchNormalization(),

Activation("relu"),

Dense(len(categories)),

BatchNormalization(),

Activation("softmax"),

])

opt = SGD(learning\_rate=0.01, momentum=0.9, nesterov=False, name="SGD")

Batch 8

Epochs 20

Imagen que contiene teclado

Descripción generada automáticamente

Mean Accuracy: 35.618%

Mean Recall: 45.094%

Mean Precision: 20.027%

> CARGO\_PLANE: Recall: 92.222% Precision: 13.409% Specificity: 98.981% Dice: 23.413%

> HELICOPTER: Recall: 22.727% Precision: 9.091% Specificity: 99.905% Dice: 12.987%

> SMALL\_CAR: Recall: 50.705% Precision: 95.195% Specificity: 98.830% Dice: 66.167%

> BUS: Recall: 55.164% Precision: 7.258% Specificity: 94.252% Dice: 12.828%

> TRUCK: Recall: 18.076% Precision: 9.972% Specificity: 95.055% Dice: 12.853%

> MOTORBOAT: Recall: 38.362% Precision: 2.859% Specificity: 94.233% Dice: 5.321%

> FISHING\_VESSEL: Recall: 63.492% Precision: 0.578% Specificity: 86.910% Dice: 1.145%

> DUMP\_TRUCK: Recall: 22.500% Precision: 1.234% Specificity: 95.887% Dice: 2.340%

> EXCAVATOR: Recall: 77.143% Precision: 6.870% Specificity: 97.213% Dice: 12.617%

> BUILDING: Recall: 28.236% Precision: 91.566% Specificity: 95.571% Dice: 43.162%

> STORAGE\_TANK: Recall: 51.600% Precision: 2.090% Specificity: 88.469% Dice: 4.017%

> SHIPPING\_CONTAINER: Recall: 20.896% Precision: 0.202% Specificity: 86.833% Dice: 0.400%