

This dataset contains 9 different seafood types collected from a supermarket in Izmir, Turkey for a university-industry collaboration project at Izmir University of Economics, and this work was published in ASYU 2020. Dataset includes, gilt head bream, red sea bream, sea bass, red mullet, horse mackerel, black sea sprat, striped red mullet, trout, shrimp image samples.

```
In [1]: from tensorflow.keras.models import Sequential
        from tensorflow.keras.layers import Dense, Convolution2D, MaxPooling2D, Flatten

        from tensorflow.keras.preprocessing.image import ImageDataGenerator

        train_datagen = ImageDataGenerator(rescale = 1./255, shear_range = 0.2, zoom_range = 0.2, horizontal_flip = True)
        test_datagen = ImageDataGenerator(rescale = 1./255)

        x_train = train_datagen.flow_from_directory(r'traini', target_size = (64,64), batch_size = 32, class_mode = "categorical")
        x_test = test_datagen.flow_from_directory(r'testi', target_size = (64,64), batch_size = 32, class_mode = "categorical")

        Found 430 images belonging to 9 classes.
        Found 294 images belonging to 9 classes.
```

```
In [2]: x_train.class_indices
```

```
Out[2]: {'Black Sea Sprat': 0,
         'Gilt Head Bream': 1,
         'Horse Mackerel': 2,
         'Red Mullet': 3,
         'Red Sea Bream': 4,
         'Sea Bass': 5,
         'Shrimp': 6,
         'Striped Red Mullet': 7,
         'Trout': 8}
```

```
In [3]: model = Sequential()
```

```
In [4]: model.add(Convolution2D(32,(3,3),input_shape = (64,64,3)))

        model.add(MaxPooling2D((2,2)))

        model.add(Flatten())
```

```
In [5]: model.add(Dense(units = 256, kernel_initializer= "random_uniform",activation = "relu"))

        model.add(Dense(units = 9 , kernel_initializer= "random_uniform",activation = "softmax"))

        model.compile(optimizer= "adam",loss = "categorical_crossentropy" , metrics =["accuracy"])
```

```
In [6]: model.fit_generator(x_train, steps_per_epoch = 430/32 , epochs = 10 , validation_data = x_test, validation_steps = 294/32 )
```

C:\Users\Anura\anaconda3\lib\site-packages\tensorflow\python\keras\engine\training.py:1940: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which supports generators.
warnings.warn("`Model.fit_generator` is deprecated and "

```
Epoch 1/10
13/13 [=====] - 52s 4s/step - loss: 2.8701 - accuracy: 0.1326 - val_loss: 1.9976 - val_accuracy: 0.3741
Epoch 2/10
13/13 [=====] - 51s 4s/step - loss: 1.8900 - accuracy: 0.3488 - val_loss: 1.7107 - val_accuracy: 0.4354
Epoch 3/10
13/13 [=====] - 28s 2s/step - loss: 1.5618 - accuracy: 0.4581 - val_loss: 1.3710 - val_accuracy: 0.4728
Epoch 4/10
13/13 [=====] - 28s 2s/step - loss: 1.3565 - accuracy: 0.5326 - val_loss: 1.1358 - val_accuracy: 0.5918
Epoch 5/10
13/13 [=====] - 28s 2s/step - loss: 1.1341 - accuracy: 0.6000 - val_loss: 0.9560 - val_accuracy: 0.7211
Epoch 6/10
13/13 [=====] - 28s 2s/step - loss: 1.0008 - accuracy: 0.6860 - val_loss: 0.8110 - val_accuracy: 0.7449
Epoch 7/10
13/13 [=====] - 29s 2s/step - loss: 0.8753 - accuracy: 0.7116 - val_loss: 0.6298 - val_accuracy: 0.8265
Epoch 8/10
13/13 [=====] - 54s 4s/step - loss: 0.7676 - accuracy: 0.7651 - val_loss: 0.5878 - val_accuracy: 0.8469
Epoch 9/10
13/13 [=====] - 46s 4s/step - loss: 0.7101 - accuracy: 0.7884 - val_loss: 0.5136 - val_accuracy: 0.8503
Epoch 10/10
13/13 [=====] - 46s 4s/step - loss: 0.5921 - accuracy: 0.8349 - val_loss: 0.4272 - val_accuracy: 0.8844
```

```
Out[6]: <tensorflow.python.keras.callbacks.History at 0x18876e61f70>
```

```
In [7]: model.save("fishi.h5")
```

```
In [ ]:
```