

IBM Project Name: Real-Time Communication System Powered by AI for Specially Abled

TEAM ID: PNT2022TMID46015

TEAM Lead: Akash S

Image Preprocessing

```
In []:
from tensorflow.keras.preprocessing.image import ImageDataGenerator

# Training Datagen
train_datagen =
ImageDataGenerator(rescale=1/255, zoom_range=0.2, horizontal_flip=True, vertical_flip=False)
# Testing Datagen
test_datagen = ImageDataGenerator(rescale=1/255)

In []:

import tensorflow as tf
import os
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Conv2D, Flatten, Dropout,
MaxPooling2D
from tensorflow.keras.preprocessing.image import ImageDataGenerator
import numpy as np
import matplotlib.pyplot as plt
import IPython.display as display
from PIL import Image
import pathlib
```

Apply ImageDataGenerator Functionality To Train And Test set

```
In []:
from google.colab import drive

In [8]:
!unzip '/content/DATASET.zip'
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inflating: Dataset/training_set/I/1482.png
extracting: Dataset/training_set/I/1483.png
inflating: Dataset/training_set/I/1484.png
inflating: Dataset/training_set/I/1485.png
extracting: Dataset/training_set/I/1486.png
extracting: Dataset/training_set/I/1487.png
inflating: Dataset/training_set/I/1488.png
inflating: Dataset/training_set/I/1489.png
inflating: Dataset/training_set/I/149.png
inflating: Dataset/training_set/I/1490.png
extracting: Dataset/training_set/I/1491.png
extracting: Dataset/training_set/I/1492.png
extracting: Dataset/training_set/I/1493.png
extracting: Dataset/training_set/I/1494.png
extracting: Dataset/training_set/I/1495.png
inflating: Dataset/training_set/I/1496.png
extracting: Dataset/training_set/I/1497.png
extracting: Dataset/training_set/I/1498.png
extracting: Dataset/training_set/I/1499.png
inflating: Dataset/training_set/I/15.png
inflating: Dataset/training_set/I/150.png
inflating: Dataset/training_set/I/1500.png
extracting: Dataset/training_set/I/1501.png
extracting: Dataset/training_set/I/1502.png
inflating: Dataset/training_set/I/1503.png
inflating: Dataset/training_set/I/1504.png
extracting: Dataset/training_set/I/1505.png
extracting: Dataset/training_set/I/1506.png
inflating: Dataset/training_set/I/1507.png
inflating: Dataset/training_set/I/1508.png
inflating: Dataset/training_set/I/1509.png
inflating: Dataset/training_set/I/151.png
inflating: Dataset/training_set/I/1510.png
inflating: Dataset/training_set/I/1511.png

```
extracting: Dataset/training_set/I/1512.png
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extracting: Dataset/training_set/I/1514.png
extracting: Dataset/training_set/I/1515.png
extracting: Dataset/training_set/I/1516.png
extracting: Dataset/training_set/I/1517.png
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inflating: Dataset/training_set/I/1519.png
inflating: Dataset/training_set/I/1520.png
extracting: Dataset/training_set/I/1520.png
extracting: Dataset/training_set/I/1521.png
extracting: Dataset/training_set/I/1522.png
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extracting: Dataset/training_set/I/1527.png
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inflating: Dataset/training_set/I/1540.png
inflating: Dataset/training_set/I/1541.png
extracting: Dataset/training_set/I/1541.png
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extracting: Dataset/training_set/I/1543.png
inflating: Dataset/training_set/I/1544.png
inflating: Dataset/training_set/I/1545.png
inflating: Dataset/training_set/I/1546.png
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extracting: Dataset/training_set/I/1548.png
extracting: Dataset/training_set/I/1549.png
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inflating: Dataset/training_set/I/1551.png
extracting: Dataset/training_set/I/1552.png
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inflating: Dataset/training_set/I/1556.png
inflating: Dataset/training_set/I/1557.png
inflating: Dataset/training_set/I/1558.png
inflating: Dataset/training_set/I/1559.png
inflating: Dataset/training_set/I/1560.png
extracting: Dataset/training_set/I/1561.png
inflating: Dataset/training_set/I/1562.png
extracting: Dataset/training_set/I/1563.png
```

inflating: Dataset/training_set/I/1564.png
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extracting: Dataset/training_set/I/1567.png
inflating: Dataset/training_set/I/1568.png
extracting: Dataset/training_set/I/1569.png
inflating: Dataset/training_set/I/157.png
extracting: Dataset/training_set/I/1570.png
extracting: Dataset/training_set/I/1571.png
extracting: Dataset/training_set/I/1572.png
extracting: Dataset/training_set/I/1573.png
extracting: Dataset/training_set/I/1574.png
extracting: Dataset/training_set/I/1575.png
extracting: Dataset/training_set/I/1576.png
extracting: Dataset/training_set/I/1577.png
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inflating: Dataset/training_set/I/1579.png
inflating: Dataset/training_set/I/158.png
inflating: Dataset/training_set/I/1580.png
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inflating: Dataset/training_set/I/1585.png
inflating: Dataset/training_set/I/1586.png
inflating: Dataset/training_set/I/1587.png
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inflating: Dataset/training_set/I/1592.png
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extracting: Dataset/training_set/I/1599.png
inflating: Dataset/training_set/I/16.png
inflating: Dataset/training_set/I/160.png
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inflating: Dataset/training_set/I/1602.png
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extracting: Dataset/training_set/I/1606.png
inflating: Dataset/training_set/I/1607.png
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inflating: Dataset/training_set/I/1614.png

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inflating: Dataset/training_set/I/1666.png
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extracting: Dataset/training_set/I/1673.png
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inflating: Dataset/training_set/I/4.png
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inflating: Dataset/training_set/I/581.png
inflating: Dataset/training_set/I/582.png
inflating: Dataset/training_set/I/583.png
inflating: Dataset/training_set/I/584.png
inflating: Dataset/training_set/I/585.png
inflating: Dataset/training_set/I/586.png
inflating: Dataset/training_set/I/587.png
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inflating: Dataset/training_set/I/59.png
inflating: Dataset/training_set/I/590.png
inflating: Dataset/training_set/I/591.png
extracting: Dataset/training_set/I/592.png
inflating: Dataset/training_set/I/593.png
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inflating: Dataset/training_set/I/599.png
inflating: Dataset/training_set/I/6.png
inflating: Dataset/training_set/I/60.png
extracting: Dataset/training_set/I/600.png
inflating: Dataset/training_set/I/601.png
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inflating: Dataset/training_set/I/603.png

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inflating: Dataset/training_set/I/656.png
extracting: Dataset/training_set/I/657.png
extracting: Dataset/training_set/I/658.png
inflating: Dataset/training_set/I/659.png
inflating: Dataset/training_set/I/66.png
inflating: Dataset/training_set/I/660.png
inflating: Dataset/training_set/I/661.png
inflating: Dataset/training_set/I/662.png
inflating: Dataset/training_set/I/663.png
extracting: Dataset/training_set/I/664.png
inflating: Dataset/training_set/I/665.png
inflating: Dataset/training_set/I/666.png
inflating: Dataset/training_set/I/667.png
inflating: Dataset/training_set/I/668.png
inflating: Dataset/training_set/I/669.png
inflating: Dataset/training_set/I/67.png
inflating: Dataset/training_set/I/670.png
inflating: Dataset/training_set/I/671.png
inflating: Dataset/training_set/I/672.png
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inflating: Dataset/training_set/I/674.png
inflating: Dataset/training_set/I/675.png
inflating: Dataset/training_set/I/676.png
inflating: Dataset/training_set/I/677.png
extracting: Dataset/training_set/I/678.png
inflating: Dataset/training_set/I/679.png
inflating: Dataset/training_set/I/68.png
inflating: Dataset/training_set/I/680.png
inflating: Dataset/training_set/I/681.png
inflating: Dataset/training_set/I/682.png
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inflating: Dataset/training_set/I/693.png
extracting: Dataset/training_set/I/694.png
inflating: Dataset/training_set/I/695.png
extracting: Dataset/training_set/I/696.png
extracting: Dataset/training_set/I/697.png
inflating: Dataset/training_set/I/698.png
inflating: Dataset/training_set/I/699.png
extracting: Dataset/training_set/I/7.png
extracting: Dataset/training_set/I/70.png
extracting: Dataset/training_set/I/700.png
inflating: Dataset/training_set/I/701.png
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inflating: Dataset/training_set/I/704.png
extracting: Dataset/training_set/I/705.png
inflating: Dataset/training_set/I/706.png

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inflating: Dataset/training_set/I/861.png
inflating: Dataset/training_set/I/862.png
extracting: Dataset/training_set/I/863.png
inflating: Dataset/training_set/I/864.png
inflating: Dataset/training_set/I/865.png
inflating: Dataset/training_set/I/866.png
inflating: Dataset/training_set/I/867.png
extracting: Dataset/training_set/I/868.png
inflating: Dataset/training_set/I/869.png
inflating: Dataset/training_set/I/87.png
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extracting: Dataset/training_set/I/886.png
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inflating: Dataset/training_set/I/904.png
extracting: Dataset/training_set/I/905.png
inflating: Dataset/training_set/I/906.png
inflating: Dataset/training_set/I/907.png
inflating: Dataset/training_set/I/908.png
inflating: Dataset/training_set/I/909.png
inflating: Dataset/training_set/I/91.png
inflating: Dataset/training_set/I/910.png
extracting: Dataset/training_set/I/911.png

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```
inflating: Dataset/training_set/I/964.png
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inflating: Dataset/training_set/I/966.png
inflating: Dataset/training_set/I/967.png
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inflating: Dataset/training_set/I/990.png
inflating: Dataset/training_set/I/991.png
inflating: Dataset/training_set/I/992.png
extracting: Dataset/training_set/I/993.png
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extracting: Dataset/training_set/I/996.png
inflating: Dataset/training_set/I/997.png
inflating: Dataset/training_set/I/998.png
inflating: Dataset/training_set/I/999.png
```

In [13]:

```
from tensorflow.keras.preprocessing.image import ImageDataGenerator
print("This dataset has been created and uploaded by IBM-TeamID-IBM-
Project-45753-1660732074")
```

This dataset has been created and uploaded by IBM-TeamID-IBM-Project-45753-1660732074

In [14]:

```
train_datagen =
ImageDataGenerator(rescale=1./255, zoom_range=0.2, horizontal_flip=True,
vertical_flip=False)
```

In [15]:

```
test_datagen= ImageDataGenerator(rescale=1./255)
```

In [19]:

```
x_train =
train_datagen.flow_from_directory('/content/drive/MyDrive/dataset/training_
set', target_size=(64,64), batch_size=300,
```

```
class_mode='categorical',
color_mode = "grayscale")
Found 15750 images belonging to 9 classes.

In [20]:
x_test =
test_datagen.flow_from_directory('/content/drive/MyDrive/dataset/test_set',
target_size=(64,64), batch_size=300,
class_mode='categorical',
color_mode = "grayscale")
Found 2250 images belonging to 9 classes.

In [21]:
x_train.class_indices

Out[21]:
{'A': 0, 'B': 1, 'C': 2, 'D': 3, 'E': 4, 'F': 5, 'G': 6, 'H': 7, 'I': 8}

In [22]:
x_test.class_indices

Out[22]:
{'A': 0, 'B': 1, 'C': 2, 'D': 3, 'E': 4, 'F': 5, 'G': 6, 'H': 7, 'I': 8}
```