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"# IBM Project Name: Real-Time Communication System Powered by AI for Specially Abled\n",

"# TEAM ID: PNT2022TMID36138\n",

"# TEAM Lead:Rohith Reddy P”

]

},

{

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"# --------------------------------------------------------------------------------------------------"

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"# IMPORTING NECESSARY LIBRARIES"

]

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"import os\n",

"import cv2\n",

"import numpy as np\n",

"import matplotlib.pyplot as plt\n",

"from keras.preprocessing.image import ImageDataGenerator"

]

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"# RENAMING DATA FILES"

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"def rename\_imgs(file\_name):\n",

" folder\_path = r'test\_dataset/'+file\_name\n",

"\n",

" num = 0\n",

" for file in os.listdir(folder\_path):\n",

" # if num%10 == 0:\n",

" # print(f'Renamed {num} files...')\n",

" # os.rename(folder\_path+'\\\\'+file, folder\_path+'\\\\'+file\_name+'\_'+str(num)+'.jpeg')\n",

" num += 1"

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"fn = 'Space'\n",

"rename\_imgs(fn)"

]

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"file\_names = '0123456789'+'ABCDEFGHIJKLMNOPQRSTUVWXYZ'\n",

"for fn in file\_names:\n",

" rename\_imgs(fn)"

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"# DISPLAYING SAMPLE IMAGES FROM DATASET"

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"test\_data\_path = 'test\_dataset/'"

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"def display(img,sign=None):\n",

" \n",

" img = cv2.cvtColor(img,cv2.COLOR\_BGR2RGB)\n",

" fig = plt.figure(figsize=(7,7))\n",

" ax = fig.add\_subplot(111)\n",

" plt.title(sign)\n",

" ax.imshow(img)"

]

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"## Training Data Images"

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]

},

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"output\_type": "display\_data"

}

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"sign\_img = cv2.imread(train\_data\_path+'O/O\_234.jpeg')\n",

"display(sign\_img,'a')"

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]

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"display(sign\_img,'A')"

]

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]

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"output\_type": "display\_data"

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"display(sign\_img,'3')"

]

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]

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"output\_type": "display\_data"

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"sign\_img = cv2.imread(train\_data\_path+'M/M\_100.jpeg')\n",

"display(sign\_img,'M')"

]

},

{

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"text/plain": [

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]

},

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"output\_type": "display\_data"

}

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"display(sign\_img,'Space')"

]

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"## Test Data Images"

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]

},

"metadata": {

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"output\_type": "display\_data"

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"display(sign\_img,'S')"

]

},

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"image/png": "",

"text/plain": [

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]

},

"metadata": {

"needs\_background": "light"

},

"output\_type": "display\_data"

}

],

"source": [

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"display(sign\_img,'Z')"

]

},

{

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]

},

"metadata": {

"needs\_background": "light"

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"output\_type": "display\_data"

}

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"source": [

"sign\_img = cv2.imread(test\_data\_path+'7/7\_8.jpeg')\n",

"display(sign\_img,'7')"

]

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{

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"# AUGMENTATION AND PREPROCESSING THE DATASET"

]

},

{

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"## Creating ImageDataGenerator"

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"outputs": [],

"source": [

"image\_gen = ImageDataGenerator(rotation\_range=30,\n",

" width\_shift\_range=0.1,\n",

" height\_shift\_range=0.1,\n",

" shear\_range=0.2,\n",

" zoom\_range=0.2,\n",

" rescale=1/255,\n",

" horizontal\_flip=True,\n",

" fill\_mode='nearest',\n",

" validation\_split=0.25)"

]

},

{

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"metadata": {

"tags": []

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"source": [

"## Original Image"

]

},

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]

},

"metadata": {

"needs\_background": "light"

},

"output\_type": "display\_data"

}

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"source": [

"sign\_img = cv2.imread(train\_data\_path+'3/3\_100.jpeg')\n",

"display(sign\_img,'3')"

]

},

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"## Augmented Images"

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"output\_type": "display\_data"

}

],

"source": [

"display(image\_gen.random\_transform(sign\_img))"

]

},

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"text/plain": [

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]

},

"metadata": {

"needs\_background": "light"

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"output\_type": "display\_data"

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"source": [

"display(image\_gen.random\_transform(sign\_img))"

]

},

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"metadata": {},

"source": [

"# SPLITING INTO TRAIN AND VALIDATION DATASET"

]

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{

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"## Train Data Generator"

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{

"name": "stdout",

"output\_type": "stream",

"text": [

"Found 41625 images belonging to 37 classes.\n"

]

}

],

"source": [

"train\_data\_gen = image\_gen.flow\_from\_directory(train\_data\_path,\n",

" target\_size=(250,250),\n",

" batch\_size=16,\n",

" shuffle=True,\n",

" class\_mode='binary',\n",

" subset='training')"

]

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{

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"metadata": {},

"source": [

"## Validation Data Generator"

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"output\_type": "stream",

"text": [

"Found 13875 images belonging to 37 classes.\n"

]

}

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"source": [

"validation\_data\_gen = image\_gen.flow\_from\_directory(train\_data\_path,\n",

" target\_size=(250,250),\n",

" batch\_size=16,\n",

" shuffle=True,\n",

" class\_mode='binary',\n",

" subset='validation')"

]

},

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"metadata": {},

"source": [

"## Test Data Generator"

]

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"outputs": [

{

"name": "stdout",

"output\_type": "stream",

"text": [

"Found 2586 images belonging to 37 classes.\n"

]

}

],

"source": [

"test\_data\_gen = image\_gen.flow\_from\_directory(test\_data\_path,\n",

" target\_size=(250,250),\n",

" batch\_size=8,\n",

" shuffle=True,\n",

" class\_mode='categorical',\n",

" )"

]

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" '5': 5,\n",

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" '7': 7,\n",

" '8': 8,\n",

" '9': 9,\n",

" 'A': 10,\n",

" 'B': 11,\n",

" 'C': 12,\n",

" 'D': 13,\n",

" 'E': 14,\n",

" 'F': 15,\n",

" 'G': 16,\n",

" 'H': 17,\n",

" 'I': 18,\n",

" 'J': 19,\n",

" 'K': 20,\n",

" 'L': 21,\n",

" 'M': 22,\n",

" 'N': 23,\n",

" 'O': 24,\n",

" 'P': 25,\n",

" 'Q': 26,\n",

" 'R': 27,\n",

" 'S': 28,\n",

" 'Space': 29,\n",

" 'T': 30,\n",

" 'U': 31,\n",

" 'V': 32,\n",

" 'W': 33,\n",

" 'X': 34,\n",

" 'Y': 35,\n",

" 'Z': 36}"

]

},

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"source": [

"train\_data\_gen.class\_indices"

]

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"text/plain": [

"array([ 0, 0, 0, ..., 36, 36, 36])"

]

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"output\_type": "execute\_result"

}

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"source": [

"test\_data\_gen.classes"

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"41625"

]

},

"execution\_count": 35,

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"output\_type": "execute\_result"

}

],

"source": [

"len(train\_data\_gen.classes)"

]

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"text/plain": [

"2586"

]

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"output\_type": "execute\_result"

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"len(test\_data\_gen.classes)"

]

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}

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"version": 3

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"version": "3.9.7"

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