**Module 9**

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Batch ID: 05062021-9AM(Weekend)

Topic: Data Augmentation Using CNN

Apply data augmentation techniques(rotation, zoom, width shift , height shift and horizontal flip) for the following images

########################### Problem1 #############################################

# Importing necessary functions

from keras.preprocessing.image import ImageDataGenerator

from keras.preprocessing.image import array\_to\_img

from keras.preprocessing.image import img\_to\_array

from keras.preprocessing.image import load\_img

# Initialising the ImageDataGenerator class.

# We will pass in the augmentation parameters in the constructor.

datagen = ImageDataGenerator(

rotation\_range = 40,

shear\_range = 0.2,

zoom\_range = 0.2,

horizontal\_flip = True,

width\_shift\_range=0.2, # horizontal shift

height\_shift\_range=0.2, # vertical shift

brightness\_range = (0.5, 1.5))

# Loading a sample image

img = load\_img('E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/images/000001.jpg')

# Converting the input sample image to an array

x = img\_to\_array(img)

# Reshaping the input image

x = x.reshape((1, ) + x.shape)

# Generating and saving 5 augmented samples

# using the above defined parameters.

i = 0

for batch in datagen.flow(x, batch\_size = 1,

save\_to\_dir ='E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/Aug image',

save\_prefix ='image', save\_format ='jpeg'):

i += 1

if i > 5:

break

################################## Problem2 ######################################

# Importing necessary functions

from keras.preprocessing.image import ImageDataGenerator

from keras.preprocessing.image import array\_to\_img

from keras.preprocessing.image import img\_to\_array

from keras.preprocessing.image import load\_img

# Initialising the ImageDataGenerator class.

# We will pass in the augmentation parameters in the constructor.

datagen = ImageDataGenerator(

rotation\_range = 40,

shear\_range = 0.2,

zoom\_range = 0.2,

horizontal\_flip = True,

width\_shift\_range=0.2, # horizontal shift

height\_shift\_range=0.2, # vertical shift

brightness\_range = (0.5, 1.5))

# Loading a sample image

img = load\_img('E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/images/000067.jpg')

# Converting the input sample image to an array

x = img\_to\_array(img)

# Reshaping the input image

x = x.reshape((1, ) + x.shape)

# Generating and saving 5 augmented samples

# using the above defined parameters.

i = 0

for batch in datagen.flow(x, batch\_size = 1,

save\_to\_dir ='E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/Aug image',

save\_prefix ='image', save\_format ='jpeg'):

i += 1

if i > 5:

break

################################# Problem3 ####################################

# Importing necessary functions

from keras.preprocessing.image import ImageDataGenerator

from keras.preprocessing.image import array\_to\_img

from keras.preprocessing.image import img\_to\_array

from keras.preprocessing.image import load\_img

# Initialising the ImageDataGenerator class.

# We will pass in the augmentation parameters in the constructor.

datagen = ImageDataGenerator(

rotation\_range = 40,

shear\_range = 0.2,

zoom\_range = 0.2,

horizontal\_flip = True,

width\_shift\_range=0.2, # horizontal shift

height\_shift\_range=0.2, # vertical shift

brightness\_range = (0.5, 1.5))

# Loading a sample image

img = load\_img('E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/images/000456.jpg')

# Converting the input sample image to an array

x = img\_to\_array(img)

# Reshaping the input image

x = x.reshape((1, ) + x.shape)

# Generating and saving 5 augmented samples

# using the above defined parameters.

i = 0

for batch in datagen.flow(x, batch\_size = 1,

save\_to\_dir ='E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/Aug image',

save\_prefix ='image', save\_format ='jpeg'):

i += 1

if i > 5:

break

############################################### Problem4 #######################

# Importing necessary functions

from keras.preprocessing.image import ImageDataGenerator

from keras.preprocessing.image import array\_to\_img

from keras.preprocessing.image import img\_to\_array

from keras.preprocessing.image import load\_img

# Initialising the ImageDataGenerator class.

# We will pass in the augmentation parameters in the constructor.

datagen = ImageDataGenerator(

rotation\_range = 40,

shear\_range = 0.2,

zoom\_range = 0.2,

horizontal\_flip = True,

width\_shift\_range=0.2, # horizontal shift

height\_shift\_range=0.2, # vertical shift

brightness\_range = (0.5, 1.5))

# Loading a sample image

img = load\_img('E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/images/000542.jpg')

# Converting the input sample image to an array

x = img\_to\_array(img)

# Reshaping the input image

x = x.reshape((1, ) + x.shape)

# Generating and saving 5 augmented samples

# using the above defined parameters.

i = 0

for batch in datagen.flow(x, batch\_size = 1,

save\_to\_dir ='E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/Aug image',

save\_prefix ='image', save\_format ='jpeg'):

i += 1

if i > 5:

break

########################################### Problem5 ############################## Importing necessary functions

from keras.preprocessing.image import ImageDataGenerator

from keras.preprocessing.image import array\_to\_img

from keras.preprocessing.image import img\_to\_array

from keras.preprocessing.image import load\_img

# Initialising the ImageDataGenerator class.

# We will pass in the augmentation parameters in the constructor.

datagen = ImageDataGenerator(

rotation\_range = 40,

shear\_range = 0.2,

zoom\_range = 0.2,

horizontal\_flip = True,

width\_shift\_range=0.2, # horizontal shift

height\_shift\_range=0.2, # vertical shift

brightness\_range = (0.5, 1.5))

# Loading a sample image

img = load\_img('E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/images/001150.jpg')

# Converting the input sample image to an array

x = img\_to\_array(img)

# Reshaping the input image

x = x.reshape((1, ) + x.shape)

# Generating and saving 5 augmented samples

# using the above defined parameters.

i = 0

for batch in datagen.flow(x, batch\_size = 1,

save\_to\_dir ='E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/Aug image',

save\_prefix ='image', save\_format ='jpeg'):

i += 1

if i > 5:

break

######################################### Problem6 ################################

from keras.preprocessing.image import ImageDataGenerator

from keras.preprocessing.image import array\_to\_img

from keras.preprocessing.image import img\_to\_array

from keras.preprocessing.image import load\_img

# Initialising the ImageDataGenerator class.

# We will pass in the augmentation parameters in the constructor.

datagen = ImageDataGenerator(

rotation\_range = 40,

shear\_range = 0.2,

zoom\_range = 0.2,

horizontal\_flip = True,

width\_shift\_range=0.2, # horizontal shift

height\_shift\_range=0.2, # vertical shift

brightness\_range = (0.5, 1.5))

# Loading a sample image

img = load\_img('E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/images/001763.jpg')

# Converting the input sample image to an array

x = img\_to\_array(img)

# Reshaping the input image

x = x.reshape((1, ) + x.shape)

# Generating and saving 5 augmented samples

# using the above defined parameters.

i = 0

for batch in datagen.flow(x, batch\_size = 1,

save\_to\_dir ='E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/Aug image',

save\_prefix ='image', save\_format ='jpeg'):

i += 1

if i > 5:

break

######################################Problem7 ##########################

from keras.preprocessing.image import ImageDataGenerator

from keras.preprocessing.image import array\_to\_img

from keras.preprocessing.image import img\_to\_array

from keras.preprocessing.image import load\_img

# Initialising the ImageDataGenerator class.

# We will pass in the augmentation parameters in the constructor.

datagen = ImageDataGenerator(

rotation\_range = 40,

shear\_range = 0.2,

zoom\_range = 0.2,

horizontal\_flip = True,

width\_shift\_range=0.2, # horizontal shift

height\_shift\_range=0.2, # vertical shift

brightness\_range = (0.5, 1.5))

# Loading a sample image

img = load\_img('E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/images/004545.jpg')

# Converting the input sample image to an array

x = img\_to\_array(img)

# Reshaping the input image

x = x.reshape((1, ) + x.shape)

# Generating and saving 5 augmented samples

# using the above defined parameters.

i = 0

for batch in datagen.flow(x, batch\_size = 1,

save\_to\_dir ='E:/ARTIFICIAL INTELIGENCE/Assignment/Convolution Neural Network/Aug image',

save\_prefix ='image', save\_format ='jpeg'):

i += 1

if i > 5:

break