

```
In [1]: from tensorflow.keras.applications.vgg16 import VGG16, preprocess_input
import cv2
import matplotlib.pyplot as plt
import tensorflow as tf
import numpy as np
from tensorflow.keras.models import Model

DIR = "/media/rifat/STUDY/4-1/LAB/Image_Processing/image/paddy.jpeg"
import warnings
warnings.filterwarnings('ignore')
```

```
2022-09-09 12:35:55.322832: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcudart.so.10.1
```

```
In [7]: def main(x):

        img = prepare_data()
        baseModel = VGG16()
        layer_number = x
        inputs = baseModel.input
        outputs = baseModel.layers[layer_number].output
        model = Model(inputs, outputs)
        outputs = model.predict(img)
        display_channels(outputs, layer_number)
```

```
In [8]: def display_channels(chSet, layer_no):
        plt.figure(figsize = (20, 20))
        plt.suptitle('Layer-' + str(layer_no))
        for i in range(3):
            plt.subplot(3, 3, i + 1)
            plt.title('Channel-' + str(i))
            plt.imshow(chSet[0, :, :, i], cmap = 'gray')
            plt.axis('off')
        plt.show()
        plt.close()
```

In [9]:

```
def prepare_data():

    imgPath = DIR
    bgrImg = cv2.imread(imgPath)
    print(bgrImg.shape)

    rgbImg = cv2.cvtColor(bgrImg, cv2.COLOR_BGR2RGB)
    rgbImg = cv2.resize(rgbImg, (224, 224))

    print(rgbImg.shape)
    rgbImg = np.expand_dims(rgbImg, axis = 0)
    print(rgbImg.shape)

    # Preprocess image
    rgbImg = preprocess_input(rgbImg)

    return rgbImg
```

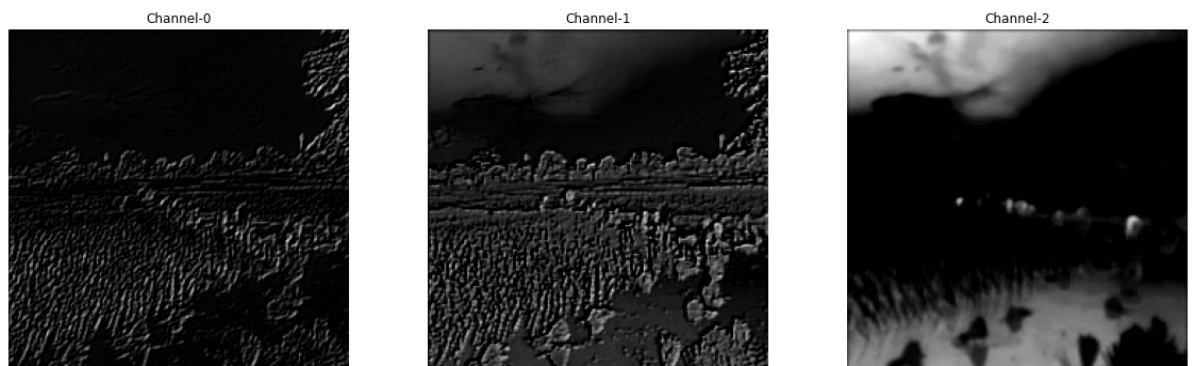
In []:

```
In [10]: if __name__ == '__main__':
          main(2)
```

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(751, 1000, 3)
(224, 224, 3)
(1, 224, 224, 3)
```

```
2022-09-09 12:49:32.976829: W tensorflow/core/framework/cpu_allocator_impl.cc:80] Allocation of 411041792 exceeds 10% of free system memory.
```

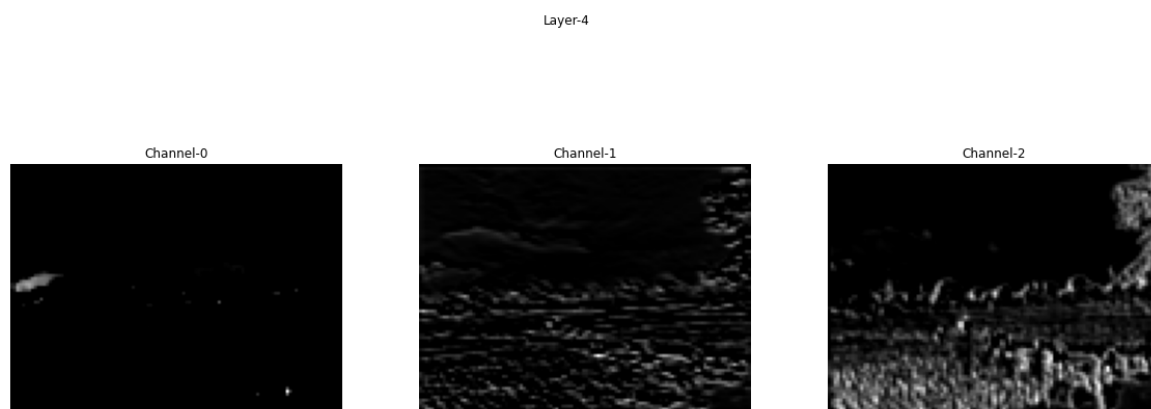
Layer-2



we can see in layer 2 filter is used 2 times. CNN extract some data but images are still Human undrstable

In [11]: `main(4)`

```
y.  
2022-09-09 12:49:36.430023: W tensorflow/core/common_runtime/bfc_allocator.cc:248] Allocator (GPU_0_bfc) ran out of memory trying to allocate 2.06GiB with freed_by_count=0. The caller indicates that this is not a failure, but may mean that there could be performance gains if more memory were available.
```



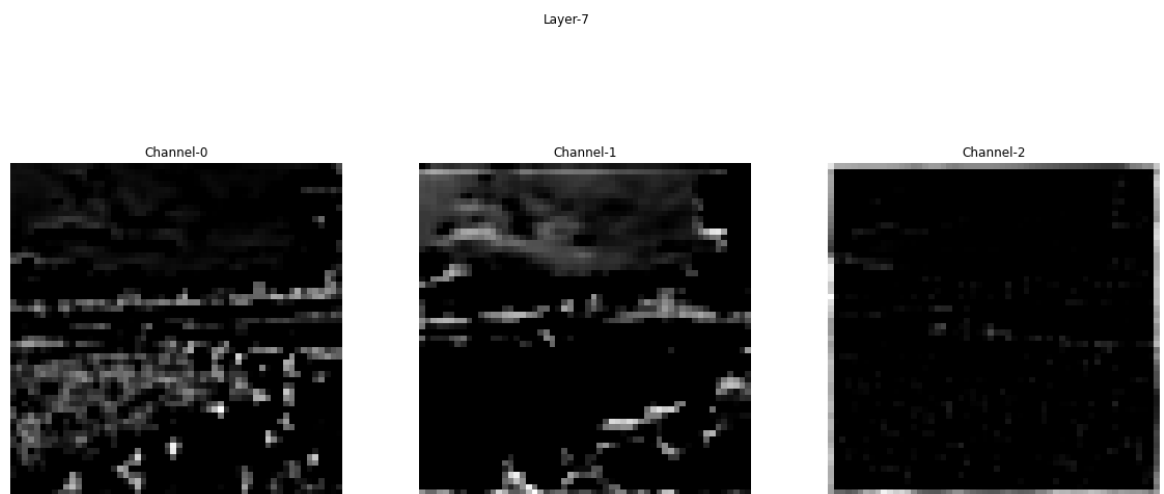
IN layes 4 in our image 4 times filters are used. After uses of filters few images are understandable by us and rest of them are only understandable by computer only

in layer 4 images shape is reduced. image information is reduced alos.

In []:

In [12]: `main(7)`

[e/function#controlling_retracing](#)) and https://www.tensorflow.org/api_docs/python/tf/function (https://www.tensorflow.org/api_docs/python/tf/function) for more details.



In layer 7 images are not understandable by human. Informations are reduced. total 7 filters is used in single image to get layers 7 images.

In []: