An Automated Depression analysis system for humans using Deep Convolution Generative Adversarial Network in Tensor Flow

Nelson Marlborough Institute of Technology
Te Whare Wānanga o Te Tau Ihu o Te Waka a Maui

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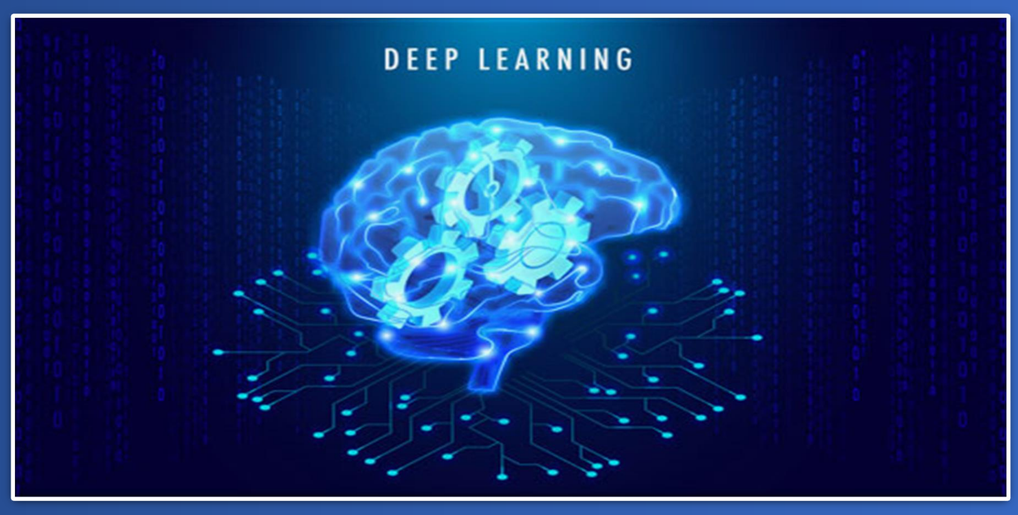
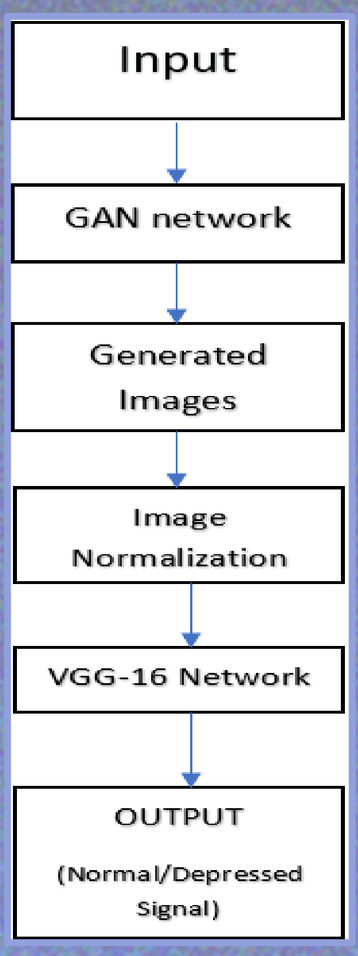
Deep learning with Deep Convolution Generative Adversarial Network

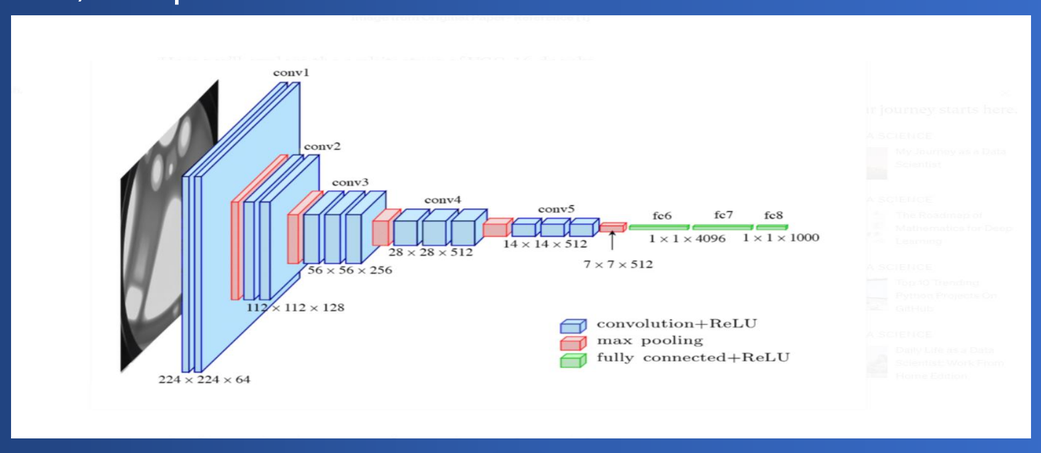
Deep learning can train the devices to perform tasks such as understanding expression, identifying images, detecting an object at level based on the nonlinear approach, representing elevated amounts. The architecture essentially influences Deep Convolutional Neural Networks to generate images belonging to a given distribution from noisy data using the Generator-Discriminator framework.





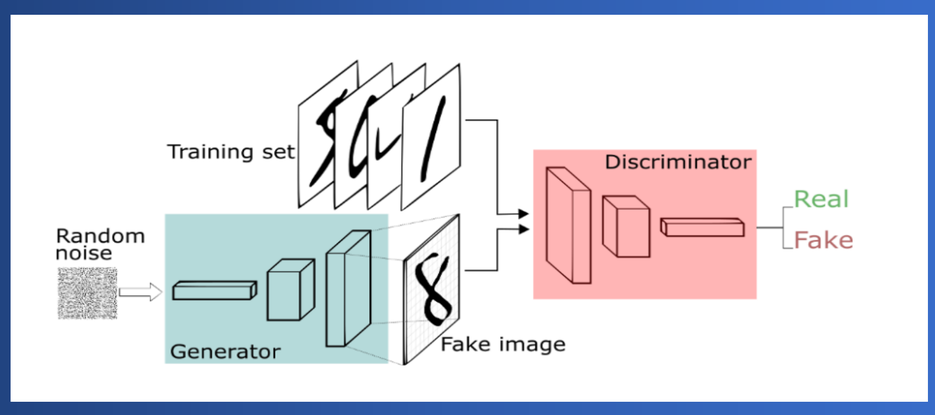
VGG-16 Network:

VGG-16 is the architecture of a classical convolutional neural network. The prime focus will be on how to increase the depth of this network, Significant enhancements to VGG include using large kernel-sized filter with multiple kernel-sized filter one after the other, compared to Other networks.



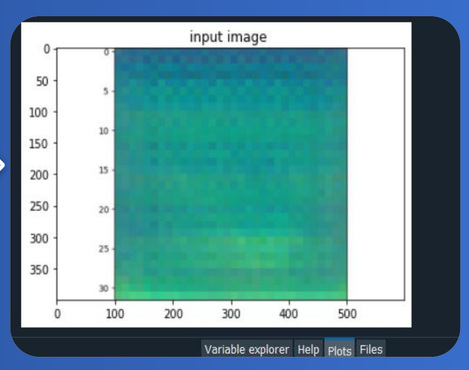
Data augmentation using GAN

The GAN architecture is divided into two sub-models. One is Generator model which generates new samples, and the other model is discriminator model which classifies the data generated by the generator model in such a way that it identifies if it is a real or fake data.



Testing

Once training is done the testing part is done manually and output received.

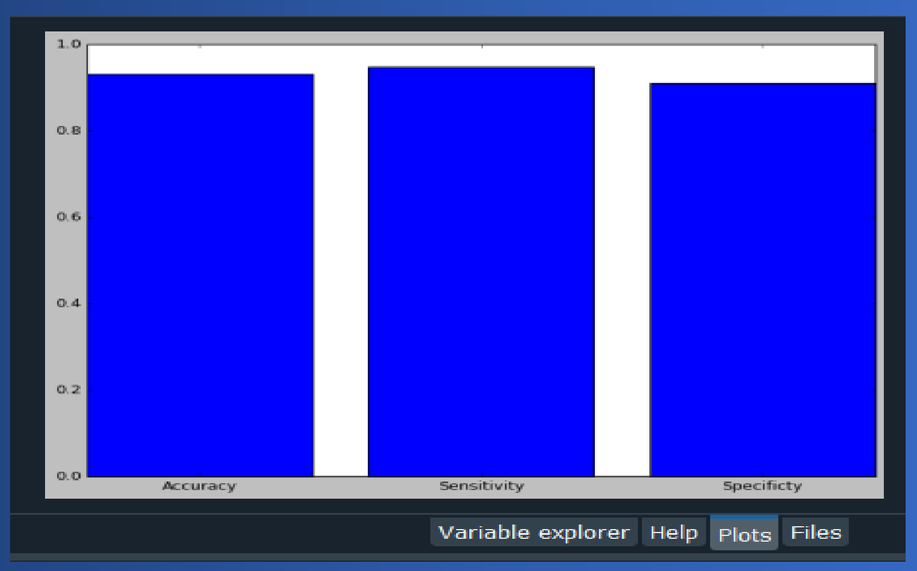



```
  model.add(Convolution2D(128, nb_conv, nb_conv))
Train on 140 samples, validate on 60 samples
Epoch 1/3
140/140 [==============================] - 8s 58ms/step - loss: 1.6729 - acc: 0.5357 - val_loss:
0.7007 - val_acc: 0.4500
Epoch 2/3
140/140 [==============================] - 6s 46ms/step - loss: 0.6999 - acc: 0.5071 - val_loss:
0.6987 - val_acc: 0.4500
Epoch 3/3
140/140 [==============================] - 7s 47ms/step - loss: 0.6902 - acc: 0.5000 - val_loss:
0.6999 - val_acc: 0.4500

Enter your imagetest: test2.jpg
THE OUPUT IS ---------->>>>>>>>>>>>>>>>>>>>>>>>>
NORMAL
```

Performance graph using Confusion Matrix

A confusion matrix is a method to summarize the efficiency of a classification method and to test the output of a classification model. It is often a description of the effects of prediction on an issue with classification. The number of positive and faulty predictions is calculated and subdivided by each class by counting quantities.



So, for this system the accuracy is found as 93%, sensitivity 94% and specificity for this system is measured as 90% from the graph.

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