**Pneumonia Assistance detector:**

**Project Description:**

**FDA submission** document outlines the how AI is used to assist in predicting whether the patient chest X-Ray can interpret whether the infection is due to Pnemonia.

There are 4 different models were tried in different environments.

1. Udacity Environment: (buildandtrainmoduleudacityenvironment. ipynb) This is simple ML Ops exercise as the environment was set up by Udacity. The transfer learning approach with VGG19 as the base model with few dense layers was used. The EDA analysed to get the details 111K images having a combination of 16 + different diseases.
2. P-620 CPU (ChestXrayKaggledbiDdisk.ipynb) The program ran in CPU. The data was stored in D-Disk. It is one of the slowest runs.
3. P-620 2-GPU: (buidandtrainmodeltwofinal.ipynb) Setting up two GPUs and they are NVIDIAT1000 and Quadro P620. They are heterogenous GPUs and setting up them and making them one of the most of the complex one.

Two key changes needed are 1) TF \_MIN\_GPU\_MULTIPROCESSOR\_COUNT=4 2)Cross GPU communication set up through tf.distribute.HierchicalCopyAllReduce() for cross\_device\_ops

One another main change is to use ResNet instead of VGG19. That helped training with larger batch size of training than 6 and 4 that was used with P620 CPU / 2GPU approach.

1. Another model that was run is google buildandtrainmodelgooglecolab.ipynb. This includes the steps to directly download the files from Google colab and running a model in Google colab pro.

**Reference**

Pneumonia description:

<https://www.radiologyinfo.org/en/info/pneumonia> (radiology information)

<https://towardsdatascience.com/a-python-beginners-look-at-loc-part-1-cb1e1e565ec2> (.loc information)

<https://pandas.pydata.org/docs/reference/api/pandas.DataFrame.html> dataframe operations

<https://radiologyassistant.nl/chest/chest-x-ray/lung-disease> different type of lung diesese

ax[int(i/rows),int(i % rows)].axis('off')

<https://towardsdatascience.com/step-by-step-vgg16-implementation-in-keras-for-beginners-a833c686ae6c>

<https://www.run.ai/guides/gpu-deep-learning/tensorflow-gpu#Setting-Up-GPUs-on-Windows>

<https://medium.com/analytics-vidhya/solution-to-tensorflow-2-not-using-gpu-119fb3e04daa>

Seems to be working but not seeing both the GPUs.

Can see only 5 in a batch working and also

<https://www.youtube.com/watch?v=57N1g8k2Hwc>

Kaggle install

<https://www.analyticsvidhya.com/blog/2021/06/how-to-load-kaggle-datasets-directly-into-google-colab/>