Problem:

Pneumonia is a very common type of infection in the world. More than 1 million adults are hospitalized with pneumonia and around 50,000 die from the disease every year in the US alone (CDC, 2017). The infection spreads in the lungs area of a human body. Pneumonia can be monitored via the chest X-ray(CXR). Physicians use this X-ray image to diagnose or monitor treatment for conditions of pneumonia. Also the chest X-rays is used in the diagnosis of different diseases like emphysema, lung cancer, line and tuberculosis.

The diagnosis of pneumonia on CXR is complicated because of a number of other conditions in the lungs such as fluid overload, bleeding, volume loss, lung cancer. In addition, clinicians are reading high volumes of images every shift. Sometimes being tired or distracted clinicians can miss some details in image. Pneumonia detection using deep learning can help the clinicians to diagnose the disease.

Who is your client, and why do they care about this problem?

Physicians can get help to diagnose the pneumonia from the algorithm. The algorithm helps them to separate pneumonia from other diseases. Physicians may see the details if they miss any detail in CXR. Hospitals can use the algorithm to improve the accuracy of the diagnosis.

Data:

I will use the dataset of Chest X-Ray Images (Pneumonia) from kaggle. It is a dataset of chest X-Rays.

How to solve:

I will load all the libraries and dependencies. I displayed some normal and pneumonia images to just have a look at how much different they look with the naked eye. The dataset is divided into three sets: train, validation and test sets.

I will go through the training dataset. I will do some analysis on that, look at some of the samples. I will generate data augmentation which helps in almost every case for improving the robustness of a model. I will do transfer learning. I will get the scores and get the confusion matrix.

Deliverables

- Code on GitHub
- Report

References

(CDC, 2017):
https://www.cdc.gov/nchs/fastats/pneumonia.htm

Chest X-Ray Images (Pneumonia):
https://www.kaggle.com/paultimothymooney/chest-xray-pneumonia/kernels