Brett Gordon

Capstone Project #3 - Project Proposal

In 2020, COVID-19 spread across the world and created a pandemic in the likes of which hadn't been seen in the past hundred years. Unfortunately, this disease has become endemic and will live with humanity, like the flu and other illnesses. With this knowledge, it is vital to be able to recognize COVID in patients as fast and as accurately as possible. This information can lead to faster and better treatment for each patient and will be extremely useful in countries where medications and vaccines aren't as readily available.

We have been reached out in regards to this, being asked to design a model that can be rolled out to these places in order to create a safer and faster reaction by doctors and hospitals. In an effort to accelerate our process, we have been supplied with over 20,000 images of X-Rays of lungs. Some of these images were supplied by the RSNA (Radiology Society of North America) and a medical school in Germany. Other images come from the padchest dataset, the Chest X-Ray Images database, Kaggle and GitHub. Roughly half of these images are of normal lungs with the remaining either having Lung Opacity, Viral Pneumonia, or COVID-19.

With the help of Deep Learning, Image Processing, and Convoluted Neural Networks we will create a classification model to help predict one ailment from another. As we already have 4 different labels we can use this information for a supervised learning method. This data has been formatted into PNG files of size 299x299. We will use Image Processing models and determine which one has the best overall accuracy, recall, precision and F1 score.

After this model is discovered, a final report will be written, explaining the case study and how we went about creating this model. A presentation will be given to stakeholders to give a rundown on what they can expect also. Finally, this model will be shipped out to the stakeholders in an executable file. The model will read future X-Ray images and classify at a highly successful rate if the patient is suffering from COVID-19 or a different ailment such as Viral Pneumonia or Lung Opacity.