Choose Research Area and Datasets

**Research on Chest X-rays:**

After having above idea in my mind I just want to do research on available X-Rays to know the severity of the disease and level of infection inside the body so that public can alert and have a chance to consult or ask doctor for remedy for the damage and doctors can easily identify and give proper medication to the patient. I thought to explore X-ray images as doctors frequently use X-rays and CT scans to diagnose pneumonia, lung inflammation, abscesses, and enlarged lymph nodes. Since COVID-19 attacks the epithelial cells that line our respiratory tract, we can use X-rays to analyse the health of a patient’s lungs. Given that nearly all hospitals have X-ray imaging machines, it could be possible to use X-rays to test for COVID-19 without the dedicated test kits.

A drawback is that X-ray analysis requires a radiology expert and takes significant time which is precious when people are sick around the world. Therefore developing an automated analysis system is required to save medical professionals valuable time.

**Datasets:**

A team of researchers from Qatar University, Doha, Qatar, and the University of Dhaka, Bangladesh along with their collaborators from Pakistan and Malaysia in collaboration with medical doctors have created a database of chest X-ray images for COVID-19 positive cases along with Normal and Viral Pneumonia images. This COVID-19, normal and other lung infection dataset is released in stages. In the first release they have released 219 COVID-19, 1341 normal and 1345 viral pneumonia chest X-ray (CXR) images. In the first update, they have increased the COVID-19 class to 1200 CXR images. In the 2nd update, they have increased the database to **3616** COVID-19 positive cases along with **10,192** Normal and **1345** Viral Pneumonia images [2] [3].

A dataset of **2373** Chest X-ray (CXR) images from Stony Brook Medicine. Each CXR has been scored by two radiologists. There are multiple CXRs per patient and temporal information is included [1].

A dataset of 3,875 images for training of pneumonia with 1341 normal chest x-rays. Testing with 390 images and 234 normal images for it. They have used 9 pneumonia images and 8 normal images for validation of model [2].

Severity can be taken from RALO (Radiographic Assessment of Lung Opacity) dataset in which Radiological scoring was performed by three blinded experts [1].

**GitHub Structure:**

**https://github.com/KutalaMohanPrasad/Mohan\_COMP5800YDG\_Research\_Project**

The Root: The root should be reserved for configuration files, documentation (such as README.md and others). Also, it can contain VS solution files and git files.

/src: We all know this one. This is where all source files are placed. However, in languages that use headers (or if you have a framework for your application) don't put those files in here.

/lib, /dep, /inc etc.: This is the directory where all your dependencies should be stored. Also, if you have your project in multiple files, put your headers and attached source in here.

/doc: Documentation goes in here. For example, docs.md.

/res: A less common one. For all static resources in your project. For example, images and audio.

/tools, /scripts: Convenience directory for your use. Should contain scripts to automate tasks in the project, for example, build scripts, rename scripts. Usually contains .sh, .cmd files for example.

/build: The place where your built files will go. Usually split into two directories, Debug and Release, it can contain binaries, .DLLs and any compiled files. It may also contain build scripts, like makefiles, but they should generally be in the root.

/test: Contains unit tests... no, in fact, all tests!

**References:**

*[1]. Joseph Paul Cohen Stanford University; Beiyi Shen; Almas Abbasi; Mahsa Hoshmand-Kochi; Samantha Glass; Haifang Li; Matthew P Lungren; Akshay Chaudhari; Tim Q Duong ” Stonybrook Radiographic Assessment of Lung Opacity (RALO) dataset is here: Pneumonia severity scores for 2373 images”* [*https://zenodo.org/record/4634000#.YX2YGp7MJPY*](https://zenodo.org/record/4634000#.YX2YGp7MJPY)

*[2] ieee8023. “IEEE8023/Covid-Chestxray-Dataset: We Are Building an Open Database of COVID-19 Cases with Chest X-Ray or CT Images.” GitHub. Accessed December 6, 2021. https://github.com/ieee8023/covid-chestxray-dataset.*

*[3] James C. Church, Yixin Chen, and Stephen V. Rice Department of Computer and Information Science, University of Mississippi, “A Spatial Median Filter for Noise Removal in Digital Images”, IEEE, page(s): 618- 623, 2008.*

*[4] Paul M (2020) Kaggle chest X-ray images (pneumonia) dataset. https://www.kaggle.com/paultimothymooney/chest-xray-pneumonia/*