Problem Statement

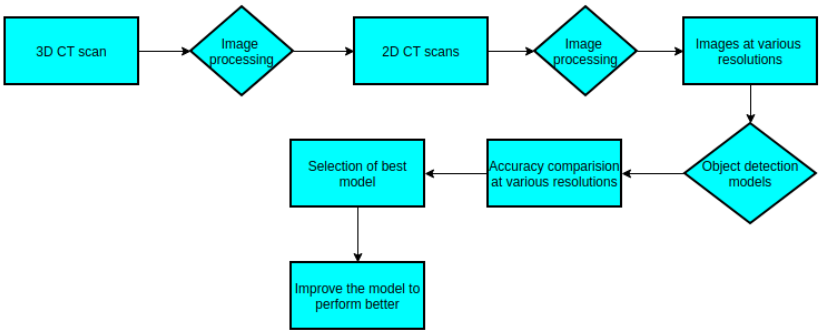

Figure 1: Problem Statement

- To carry out the survey of the various object detection models
- To carry out the survey of various CT scan datasets for object detection
- To select 2 models for object detection as well as the select the dataset taken into consideration.
- To compare the accuracies of the models at different resolutions and select the best model
- To analyse the impact of resolution in accuracies of the model and frames per second the model can predict
- To make some more changes to the model and try to improve the model

Expected Goals

- Minimum
  - To survey the various object detection models.
  - To survey the various CT scan datasets.
  - To select two object detection models.
- Expected
  - Implementation of both object detection models.
  - Comparison of accuracies of the models at different resolution and select the best model.
- Maximum
  - To improve the model's performance.

Datasets

- **kits 19 Dataset (3D images, but for segmentation, bounding boxes not available)**
  - The dataset can be downloaded from this link
  - Information of the dataset can be found from this link
  - number of images = 300
- **RSNA pneumonia detection challenge (2D images)**
  - number of images = 26684
  - The dataset can be downloaded from this link
  - Description: The main aim for which the dataset was created is to determining if the patient has pneumonia based on chest radiograph. If the patient has pneumonia it also has bounding box for lung opacity else the bounding box co-ordinate is absent.

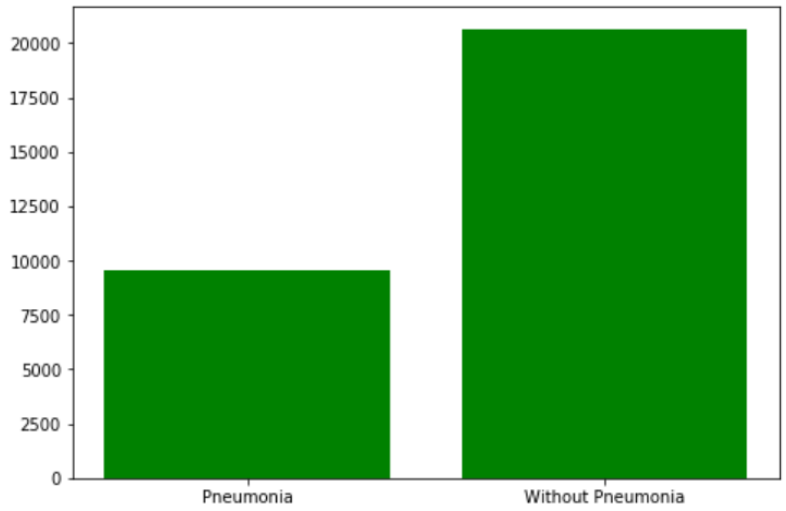

Figure 2: Data distribution

Only 9555 patients has pneumonia, which also means only 9555 points in the data are labeled with bounding box co-ordinates.

- **Covid 19 chest x-ray dataset(2D images)**
  - The dataset can be downloaded from this link
  - number of images = 1230
  - resolution of image = 72*72
  - Description of data : The dataset is the collection of 616 images that has lung bounding boxes for Chest X-ray dataset of COVID-19 cases. The annotation is of the format of COCO dataset. The annotation has two lung bounding boxes, one for left lung and the other for right lung. It also has other tags such as Finding,Sex,Modality, Survival, View.
- **LIDC-IDRI (Image segmantation dataset used for competetion luna 2016)**
  - The dataset can be downloaded from this link
- **NIH Clinical Center -Lesion Dataset (3D images)**
  - The dataset can be downloaded from this link
  - number of images : 32000
  - Description of data: The DeepLesion dataset has 32120 CT slices from 10,594 CT scans of 4427 patients. There are from one to three lesions in each image along with bounding boxes as well as size measurements and has 32735 overll lesions in the images.