Project Title:

SIIM-ACR Pneumothorax Segmentation (Identify Pneumothorax disease in chest X-rays)

Supplementary Medical Information:

A pneumothorax occurs when air leaks into the space between lung and chest wall. This air pushes on the outside of the lung and makes it collapse. Pneumothorax can be a complete lung collapse or a collapse of only a portion of the lung.

The causes of pneumothorax are categorized as either primary spontaneous, secondary spontaneous, or traumatic.

For instance, At-risk groups for primary spontaneous pneumothorax are:

- tobacco or cannabis smokers
- people with a family history of pneumothoraces

This Task Is Not Trivial Due To:

Pneumothorax is usually diagnosed by a radiologist on a chest x-ray and can sometimes be very difficult to confirm. An accurate algorithm to detect pneumothorax would be very helpful in lots of clinical scenarios in order to avoid inappropriate treatment.

The Main Objective:

- The first phase would be developing a model to classify pneumothorax from a set of chest radiographic images
- The second phase would be segmenting the pneumothorax in the corresponding images

Methods and Algorithms:

Deep learning has been shown an amazing performance in segmentation tasks. Consequently, making use of deep learning and specifically U-net would be a rational point to start. However, modifying the structure of the network based on the nature of the problem seems necessary in this case.

Data Set:

12000 CT-scan images with .DCM format and corresponding labels as an additional .CSV file.

Data Source:

Kaggle Website