Capstone - CSCI1470 : Deep Learning

Title: Pneumonia Detection from Medical Images Using CNNs and BBR

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Abstract: Our project uses the data from the RSNA Pneumonia Detection Challenge, which provides a dataset of chest x-rays. We wanted to create a set of models that given an x-ray of a chest could predict:

1. whether or not pneumonia is present in the x-ray, and

2. create a bounding box with coordinates that contains the portion of the x-ray where evidence of the pneumonia is present.

For the first set of models, we used CNNs with medical image preprocessing to identify pneumonia and determine if certain types of image preprocessing produced better results for the medical data. Next, we used another CNN and Bounding Box Regression for object detection for pneumonia. We found that there was some slight improvement on test accuracy with the various contrast enhancement preprocessing methods, especially with Contrast Limited Adaptive Histogram Equalization. Accuracy of the bounding boxes were relatively low due to the predicted bounding boxes being a lot larger than the actual bounding boxes.

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