

Final Project Proposal: Deep Learning

Dataset: Covid-19 Radiography Database

<https://www.kaggle.com/datasets/tawsifurrahman/covid19-radiography-database>

Objective1: Use Convolutional Neural Networks and pre-trained models to find the lungs in chest x ray images. This would be done with the intention of cropping the images specifically to the lungs, which could be useful for other models that predict pneumonia and other lung conditions.

- Use lung masks and corresponding x ray to train a model that predicts the lung mask. Leverage pretrained models (e.g Unet) to do this.

- Use the model to predict the lung mask and then crop the image to the lungs.

Objective2: Develop a preprocessing pipeline for chest x rays that can be used as a first step to train other models to predict certain lung conditions from the x rays.

- Utilize transfer learning techniques to find and segment important anatomical structures in x ray images.

- Implement a multi staged process to remove or deemphasize these structures from the original x ray.

- Create processed images that primarily highlight lung tissue and minimize the visual effect of the mentioned surrounding anatomical structures.