Lung CT Image Segmentation

Using Deep Neural Networks

Deep Learning Project Report

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# Introduction

## Problem Statement

Many lung diseases like pneumonia, effusion is among the major cause of death in many countries. In Vietnam, 10% of patient who has lung disease is diagnosed of pneumonia. Among many methods to diagnose lung diseases such as flow cytometer, mucus examination, chest Xray stand out as an effective and inexpensive tool accurately points out many respiratory diseases. In Vietnam today there are many lung’s imaging study along with radiological reports that are generated daily in both public and private sector. This raises to the question if we can develop a computational system that can help doctor to diagnose more accurately.

In this study, to tackle this problem, the model is introduced to segment the lung region in CXR and cut all the region that contains the lung aiming to improve radiologist workflow, patient prioritization and support decision making for abnormalities detection.

**Data set:**

X-ray images in this data set have been acquired from the tuberculosis control program of the Department of Health and Human Services of Montgomery County, MD, USA.

This set contains 138 posterior-anterior x-rays, of which 80 x-rays are normal and 58 x-rays are abnormal with manifestations of tuberculosis. All images are de-identified and available in DICOM format. The set covers a wide range of abnormalities, including effusions and miliary patterns. The data set includes radiology readings available as a text file [1].

# Project Planning

# Diagram Description automatically generated

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| Task | Assignee |
| Data Collection | Q. Cuong, H.Phuc |
| Data Preprocessing | H.Phuc, T.Nhan |
| Lung Segmentation | Q.Anh Q.Cuong, B.Sam |
| Classification | Q.Cuong, B.Sam, H.Phuc |
| Evaluation | Q.Anh, B.Sam, T.Nhan |

# Future Work

In the future, we will leverage ResNet-50 for thorax classification with different lung diseases, we also modified the model for Lung Segmentation for optimization.

# References:

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| [1] | Pandey, "Chest X-ray Masks and Labels," 2019. [Online]. Available: https://www.kaggle.com/nikhilpandey360/chest-xray-masks-and-labels. |
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