Design Document
Deep Learning Diseases
Facebook
June 5th, 2023

Goal
- Make an ML model that detects lung cancer with at least a 70% accuracy.

Model Overview
- Import necessary dependencies
- Import the dataset from Google Drive
- Preprocess the data
  - Split data into train, validation, and testing sets
  - Balance the dataset
  - Create NumPy arrays to store data so it can be given to model
- Define the model's architecture
- Training loop
- Evaluate the model

Model Architecture
- For our model we will create a CNN with the following 36 layers:

```
DepthwiseConv2D Input | kernel_size = 64 | strides = (3, 3) | input_shape = (50, 50, 1)
Batch Normalization
ReLU Activation
DepthwiseConv2D | kernel_size = 64 | strides = (3, 3)
Batch Normalization
ReLU Activation
DepthwiseConv2D | kernel_size = 64 | strides = (3, 3)
Batch Normalization
ReLU Activation
DepthwiseConv2D | kernel_size = 128 | strides = (3, 3)
Batch Normalization
ReLU Activation
DepthwiseConv2D | kernel_size = 128 | strides = (3, 3)
Batch Normalization
ReLU Activation
DepthwiseConv2D | kernel_size = 128 | strides = (3, 3)
Batch Normalization
ReLU Activation
DepthwiseConv2D | kernel_size = 256 | strides = (3, 3)
Batch Normalization
ReLU Activation
DepthwiseConv2D | kernel_size = 256 | strides = (3, 3)
Batch Normalization
ReLU Activation
```

```
DepthwiseConv2D | kernel_size = 256 | strides = (3, 3)
Batch Normalization
ReLU Activation
GlobalAveragePooling2D())
Dropout(0.5))
Dense(512))
Batch Normalization
ReLU Activation
Dense(256))
Batch Normalization
ReLU Activation
Sigmoid activation | 2
```