PROJECT IDEATION DOCUMENT

Disease Detection from Bio-Medical Images using Deep Learning and Transfer Learning Techniques

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BACHELOR'S DEGREE IN ELECTRONICS & INSTRUMENTATION ENGINEERING

By

ESHIKA BOSE-1708079
PALLAVI-1708092
SHREY-1708103
MOHAMMAD AFFAN-1731009

UNDER THE GUIDANCE OF
PROF. PRAVEEN KUMAR SAMANTA

SCHOOL OF ELECTRONICS ENGINEERING
KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY
BHUBANESWAR, ODISHA – 751024

ABSTRACT

This project will be divided into 2 parts.

PART 1-:

In the first part, we'll discuss how diseases could be detected in CT scan images, X-rays or MRI scan of patients.

PART 2-:

Then we will discuss, how to train a deep learning model using CNN and Keras to predict desired disease in our image dataset.

TECHNOLOGIES USED

- PyCharm/Jupyter Notebook
- Convolutional Neural Network
- Deep Learning/Transfer Learning
- Keras
- Tensorflow

IMPLEMENTATION

Sample Images of MRI Scan, CT Scan, X-Ray Images.

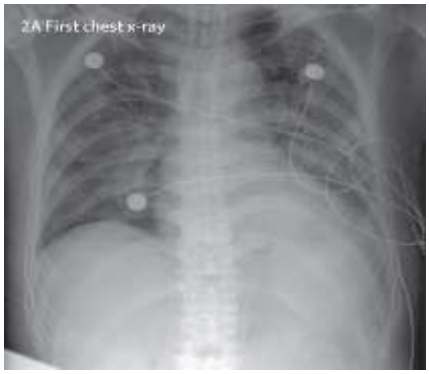

Fig-1: An X-ray image(Chest)

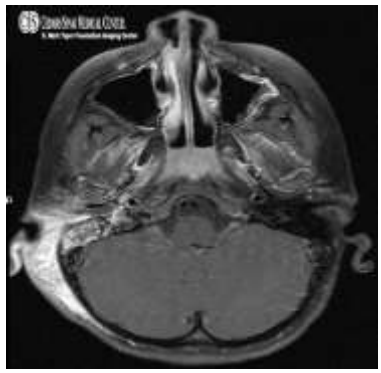

Fig-2: A CT Scan(Brain)

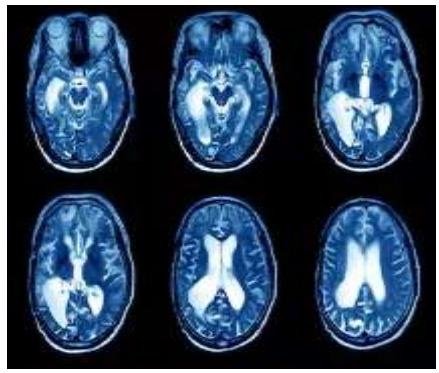

Fig-3: A MRI Scan image(Brain)

- For this purpose, we thought to explore different report images as doctors frequently use MRI scans, X-rays or CT scans to diagnose pneumonia, brain tumor, lung inflammation, and/or enlarged lymph nodes etc.
- Since in any disease any injury/attacks (by bacteria/virus) has a specific area of affect or it targets a specific part of the organ which can be visualized in our image report. So, we can use those images of infected persons and normal report of a person as our dataset.
- Using those images (MRI scans/ CT scans/ X-Rays), we can train a machine learning classifier to detect the specified disease using CNN, Keras and TensorFlow.

CONCLUSION

In this study, we will be proposing a deep transfer-learning based approach using one of the reported images obtained from diseased patients and normal persons.

In subsequent studies, the classification performance of different CNN models can be tested by increasing the number of images in the dataset.