

Covid-19 Detection from X-Ray Images using 2D CNN

Submitted by:

ABDULLAH UMAR NASIB	19166009
SAMIHA KHAN	21266007
JAWAD BIN SAYED	21341025
SUMAIYA MIM	22166007
FAHIM HASNAT	22166016
MD MAZIDUL HASAN	22166018
SM MAHSANUL ISLAM	22166037

Introduction

- ★ Coronavirus disease are usually diagnosed as pneumonia
- ★ Covid-19 was first discovered in Wuhan, China in December of 2019.
- ★ It has affected more than 147 million individuals all over the world.
- ★ The only method used for COVID-19 detection is (RT-PCR)real-time reverse transcription-polymerase chain reaction.
- ★ It has some drawbacks.
- ★ Since, Plain Radiography (chest X-ray) provides an overall picture of this disease.
- ★ We tried to build a deep learning model to detect Covid-19 using chest X-ray.

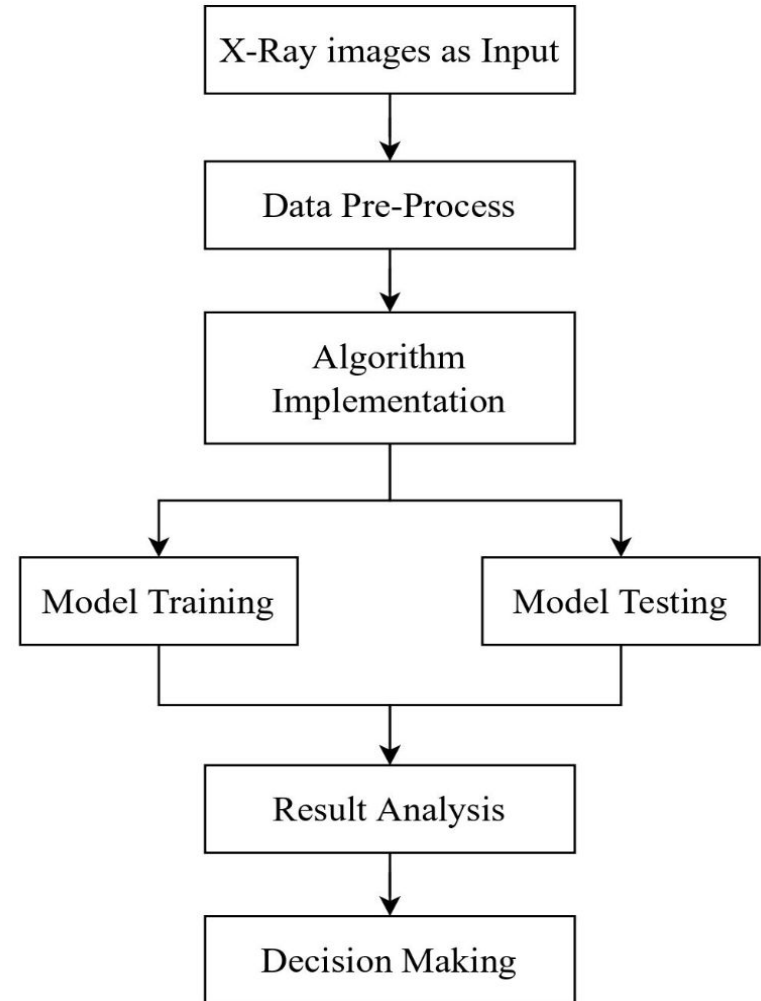
Literature Review

- ★ X. Qi, L. G. Brown, D. J. Foran, J. Noshier, and I. Hacıhaliloglu, “Chest x-ray image phase features for improved diagnosis of covid-19 using convolutional neural network,” *International Journal of computer assisted radiology and surgery*, vol. 16, no. 2, pp. 197–206, 2021.
- ★ R. Yasin and W. Gouda, “Chest x-ray findings monitoring covid-19 disease course and severity,” *Egyptian Journal of Radiology and Nuclear Medicine*, vol. 51, no. 1, pp. 1–18, 2020.
- ★ W. Wang, Y. Xu, R. Gao, et al., “Detection of SARS-CoV-2 in different types of clinical specimens,” *Jama*, vol. 323, no. 18, pp. 1843–1844, 2020.

Related Works

- ★ Support Vector Machines with various kernel functions
 - Linear
 - Quadratic
 - Cubic
 - Gaussian
- ★ NCOVnet
- ★ Deep Convolutional Neural Network

Proposed Model



Dataset Description

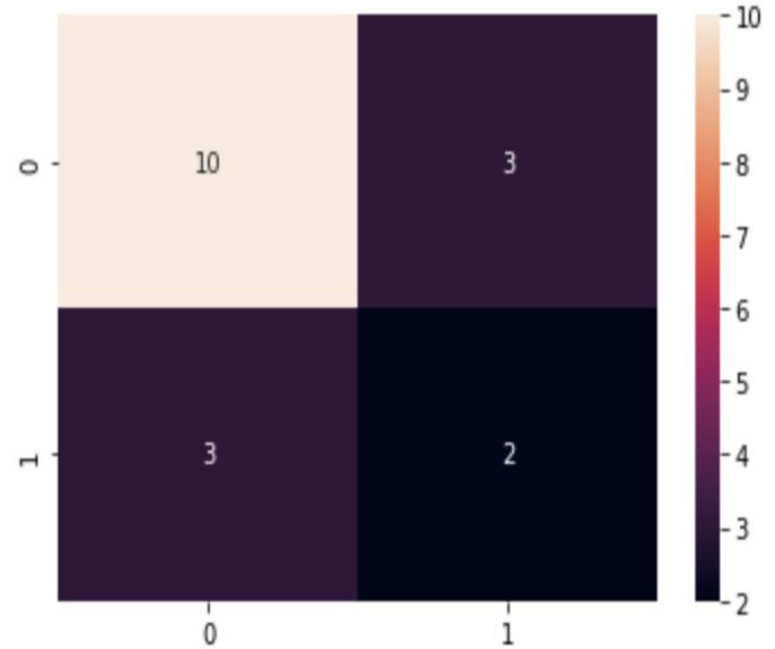
- ★ 25 x-ray images are from normal people
- ★ 69 x-ray images are from covid-19 affected people
- ★ Dataset are collected from kaggle.com
- ★ 200x200 pixels size for each image
- ★ 76 images for training
- ★ 18 images for testing

Result Analysis

	precision	recall	f1-score	support
normal	0.77	0.77	0.77	13
covid	0.40	0.40	0.40	5
accuracy			0.67	18
macro avg	0.58	0.58	0.58	18
weighted avg	0.67	0.67	0.67	18

Result Analysis

- ★ True Positive : 10
- ★ False Negative : 3
- ★ False Positive : 3
- ★ True Negative : 2



Future Work and Conclusion

- ★ Increase the dataset.
- ★ Add 3D CNN algorithm and Try a comprehensive comparison between the two methods.
- ★ It can be used to detect almost any form of disease using medical imaging.
Such as Cancer, Tooth decay, Tumor.

Thank You !