INFORMATICS INSTITUTE OF TECHNOLOGY

In Collaboration with

UNIVERSITY OF WESTMINSTER

COVID-19 Pneumonia Detection from X-ray Images

A Dissertation by

Mr. Sunera Munasinghe

Supervised by

Mr. Sudharshan Welihinda

Submitted in partial fulfilment of the requirements for the BEng (Hons) Software Engineering degree at the University of Westminster.

April 2023

ABSTRACT

The coronavirus disease of 2019(Covid-19) has been one of the most devastating diseases of the modern age, and has had a massive death toll since it originated in 2019. According to World Health Organization (WHO) as of 1st April 2023, a total of 686,391,696 has contracted the coronavirus disease, and unfortunately an amount of 6,859,379 confirmed cases has deceased due to contracting the virus. The patients that have contracted the virus will usually experience mild to moderate respiratory illness, but the above statistic proves that a majority of patients have recovered. But older people that already suffer from various cardiovascular diseases has a dangerously high probability of experiencing severe respiratory illnesses. The primary COVID-19 screening techniques, reverse transcription polymerase chain reaction (RT-PCR) and rapid antigen testing, have lately been discovered to be less accurate and dependable, according to the literature. Additionally, due to the increased demand for test kits for those approaches, conducting screening procedures is proving to be quite challenging for the global healthcare industry. A alternative computer strategy to automate the virus detection process will help the healthcare industry not only manage the enormous demand for test kits but also identify the virus more precisely and stop the sickness from spreading.

This research project focuses on creating an automated computer method to analyze patient chest X-ray pictures and identify COVID-19 using image processing methods. It was selected to employ supervised and non-transfer learning technique as the system architecture since it was discovered to be restricted in the literature after extensive review of the already published work. The approach was developed using convolutional neural networks, and the model was trained using publicly available datasets.