TRANSFER LEARNING APPROCH FOR DETECTING COVID-19 USING CHEST X-RAY IMAGES

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July 2022

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Thesis/Dissertation submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer Science

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DECLARATION

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ACKNOWLEDGEMENTS

I wish to express my sincere gratitude to my supervisor, Dr. Charith Chitraranjan, for his guidance and invaluable assistance in providing me with useful knowledge materials, advice, and supervision throughout this research work. His expertise and encouraging guidance enabled me to complete my work successfully.

I am indebted to my parents for their love and untired support throughout my life.

ABSTRACT

Due to the (COVOD-19 coronavirus, the entire world is undergoing a pandemic. Coronavirus 2 produces severe acute respiratory illness. This virus is discovered in December 2019 in China, Wuhan. As we are experiencing, the affected patients are expanding at a rapid rate. The World Health Organization (WHO) has recommended that testing be done as much as possible to recognize those who are affected and those who are carriers of this disease. However, the main issue here is the scarcity of COVID-19 testing kits and trained people to perform the testing in a pandemic situation. However, a lot of research was seeking workaround solutions for detecting the COVID-19. As a result of these projects, a few papers were polished for detecting the COVID-19 based on chest X-ray scan images. However, most of the research has used vanilla CNN, which makes the test more reliable and convenient. But we have some practical issues in the application of traditional CNN. Basically, CNN is a supervised learning method, and it takes more time for the learning process. And in general, CNN works well for larger datasets. However, the chest X-ray images are limited in practice, we propose combining transfer learning and ensemble learning techniques to achieve excellent accuracy while spending the least amount of time possible on the entire learning process. This study mainly focuses on the CNN based pre-trained models such as **DenseNet201, EfficientNetB7 and VGG16** for increasing the accuracy level of the model, which makes the test reliable and more trustworthy.

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LIST OF ABBREVIATIONS

Abbreviation	Description
RNA	Ribonucleic Acid
PCR	Polymerase Chain Reaction
CT	Computerized Tomography
RT-PCR	Reverse Transcription Polymerase Chain Reaction
ARDS	Acute Respiratory Distress Syndrome
CO2	Carbon Dioxide
O2	Oxygen
VGG16	Visual Geometry Group
ANN	Artificial Neural Network
ReLU	Rectified Linear Unit
FC	Fully Connected Layer
RESNET	Residential Energy Services Network
ANOVA	Analysis of Variance
ML	Machine Learning
NLP	Natural Language Processing
CAM	Class Activation Map