



Senior Design Project

**Covid-19 detection from X-Ray images using
deep learning methods with a web app**

Saadman Sakib ID# 1632440042

Nafisa Hassan ID# 1912043642

Sifat Anwar ID# 1812887642

Faculty Advisor:

Dr. K. M. A. Salam

Professor

Department of Electrical & Computer Engineering

Spring, 2022

DECLARATION

This is to certify that this Project is our original work. No part of this work has been submitted elsewhere partially or fully for the award of any other degree or diploma. Any material reproduced in this project has been properly acknowledged

Students' names & Signatures

.....

1. Saadman Sakib
ECE Department
North South University

.....

2. Nafisa Hassan
ECE Department
North South University

.....

3. Sifat Anwar
ECE Department
North South University

APPROVAL

We, **Saadman Sakib ID:1632440042**, **Nafisa Hassan ID: 1912043642** and **Sifat Anwar ID: 1812887642**, members of CSE: 499 (Senior Design) from the Electrical and Computer Engineering department of **North South University** have worked on the project titled “**Covid-19 detection from X-Ray images using deep learning methods with a web app**” under the supervision of Dr. K. M. A. Salam as a partial fulfillment of the requirement for the degree of Bachelors of Science in Electrical & Computer Engineering and has been accepted as satisfactory.

Supervisor’s Signature

Dr. K. M. A. Salam
Professor

Department of Electrical & Computer Engineering
North South University
Dhaka, Bangladesh.

Chairman’s Signature

Dr. Rezaul Bari
Associate Professor & Chairman

Department of Electrical & Computer Engineering
North South University
Dhaka, Bangladesh.

ACKNOWLEDGEMENT

By the mercy of the Almighty we have completed our senior design capstone project entitled “ **Covid-19 detection from X-Ray images using deep learning methods with a web app**”.

Foremost, we would like to express our sincere gratitude to our advisor Dr. K. M. A. Salam for his continuous support in our capstone project progress throughout the whole 499A and 499B, for his patience, motivation, enthusiasm, and immense knowledge. His guidance helped us in all the time of research, writing and completing of this project.

Our sincere thanks also goes to North South University, Dhaka, Bangladesh for providing an opportunity in our curriculum which enabled us to have an industrial level experience as part of our academics.

We are also very grateful to our friends, for supporting us in this project.

Last but not the least, we would like to thank our family as their inspiration and guidance kept us focused and motivated.

ABSTRACT

The World Health Organization (WHO) classified COVID-19 a global epidemic in 2019. COVID-19 is caused by SARS-CoV-2, also known as the severe acute respiratory syndrome coronavirus-2, which was found in China in late December 2019. The entire planet had been affected within a few months. COVID-19 has infected millions of individuals all over the world, making it a global health issue. The disease is usually contagious, and those who are infected can readily transfer it to others. As a result, monitoring is an effective way to stop the virus from spreading. Another condition caused by a virus linked to COVID-19 is pneumonia. The severity of pneumonia can range from minor to life-threatening. This is especially harmful for children, the elderly, and individuals with health problems or impaired immune systems. We employed deep transfer learning to classify COVID-19 and pneumonia in this experiment. Because there has been so much research on this subject, the suggested strategy focuses on enhancing accuracy and employs both a transfer learning methodology and a custom-made model. Different pretrained deep convolutional neural network (CNN) models were used to extract deep features. Classification accuracy was used to evaluate performance to a considerable extent. According to the findings of this study, deep transfer learning can detect COVID-19 and pneumonia from CXR images. VGG-16 was 94 percent accurate in pretrained custom models, InceptionV3 was 96 percent accurate, ResNet50 threshold was 83 percent accurate, and Xception was 92.82 percent accurate. All of these models are correct, however InceptionV3 is the most accurate one for detection of Covid-19. A lightweight python framework, Flask is used to incorporate our algorithm and build our entire web application and it may be widely applicable in health sector. The information is then extracted and the results of Covid-19 detection are displayed.