

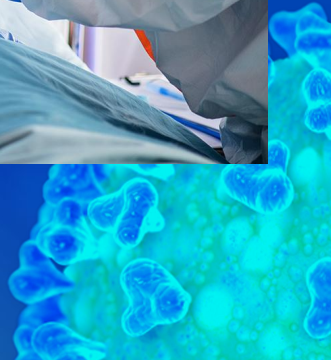


COVID-19 Classification

Through Images and Audio

What is COVID-19?

- A strain of a novel coronavirus that has not been previously detected in humans
- Highly contagious
- Easily transmissible
- Not all symptoms are present in those who become infected
- Significant percentage of those infected are asymptomatic



Some Covid Statistics

A stylized, glowing green and yellow virus particle with a textured surface, located in the top right corner of the slide.

100,000,000+

Confirmed cases worldwide

2,000,000+

Deaths worldwide

20,000+

Daily ICU Hospitalizations

In the United States since early
December 2020

100,000+

Daily Hospitalizations

In the United States since early
December 2020

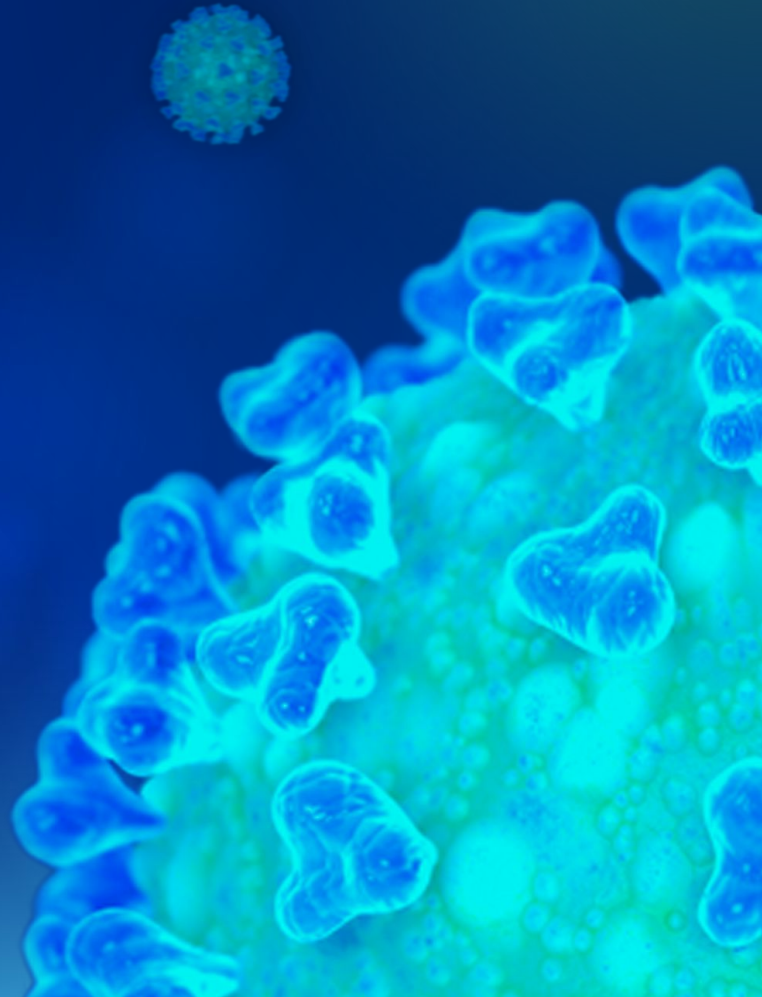
A stylized, glowing green and yellow virus particle with a textured surface, located in the bottom left corner of the slide.

Modes of Transmission:

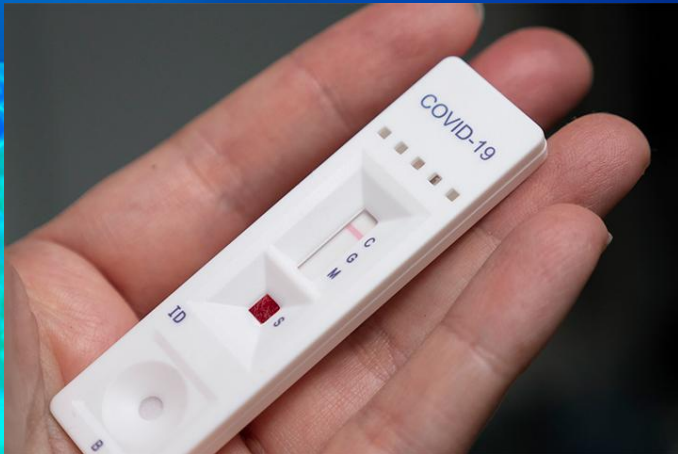
- Contact
- Droplet
- Airborne

Severity and Symptoms:

- Range from Asymptomatic → Severe
- Very few telltale symptoms:
 - Immediate and significant loss of taste and / or smell
 - “Covid toes”
 - Dry cough and shortness of breath



Types of Testing for COVID



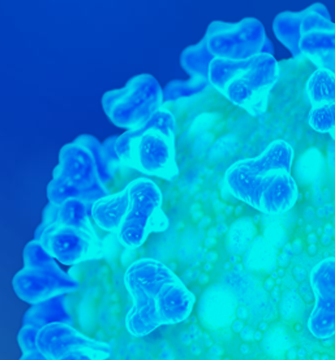
Viral Testing:

- Used if suspected of having a current COVID infection
- Two subtypes:
 - Molecular
 - Antigen

Antibody Testing:

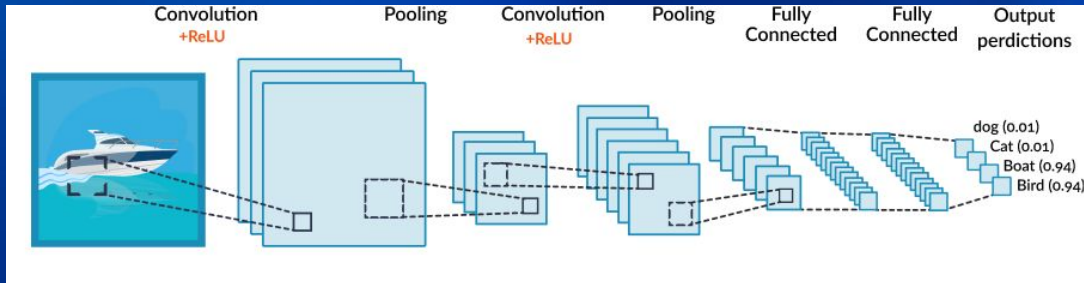
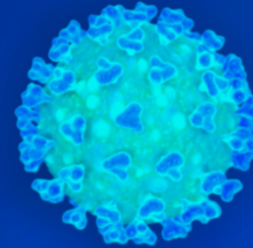
- Used to determine if a past COVID infection occurred

How Else Can We Determine if Someone Has COVID-19?



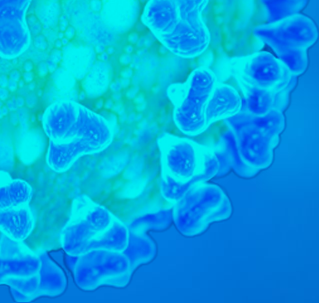
X-Ray Image Classification

1. Gathered dataset via Kaggle's API
2. Contained 3800+ high quality chest x-ray images
3. Multiple classes: Healthy, Viral Pneumonia, COVID
4. Used CLAHE as a preprocessing technique
5. Created a Sequential Convolutional Neural Network



Ex. of CNN
architecture;
not exactly
what our
model used

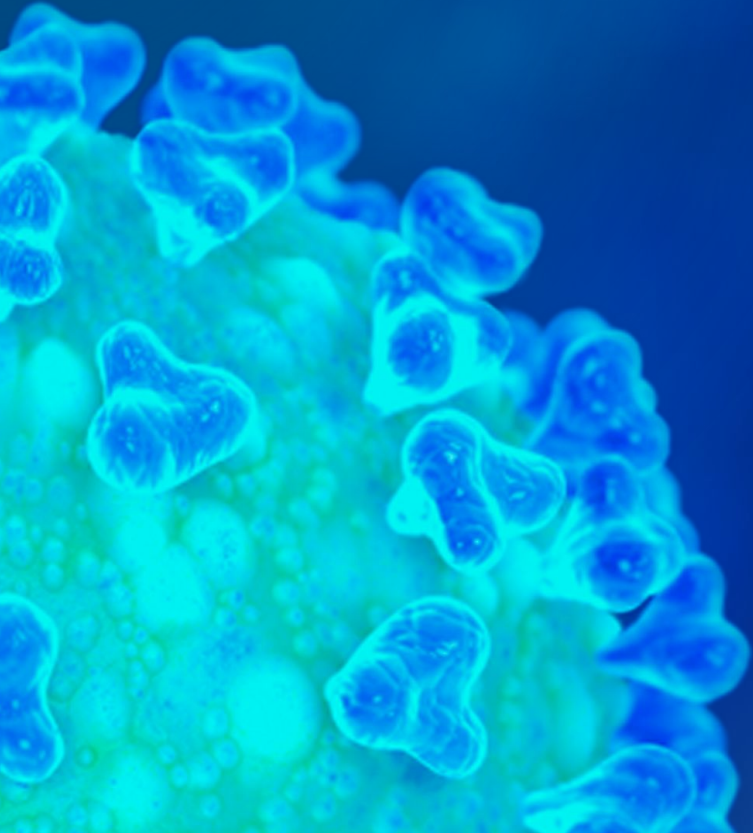
X-ray Model Evaluation Results



Classifying COVID via Audio Spectrograms

1. Gathered cough audio from University of Stanford's Virufy dataset via Github
2. Using Librosa's library, created mel-spectrogram images for each segmented mp3 audio
3. Saved images in their respective folders
4. Created train, test, split folders
5. Trained Sequential Neural Network model off the images

Virufy Model Evaluation Results





CoughVid Audio Dataset

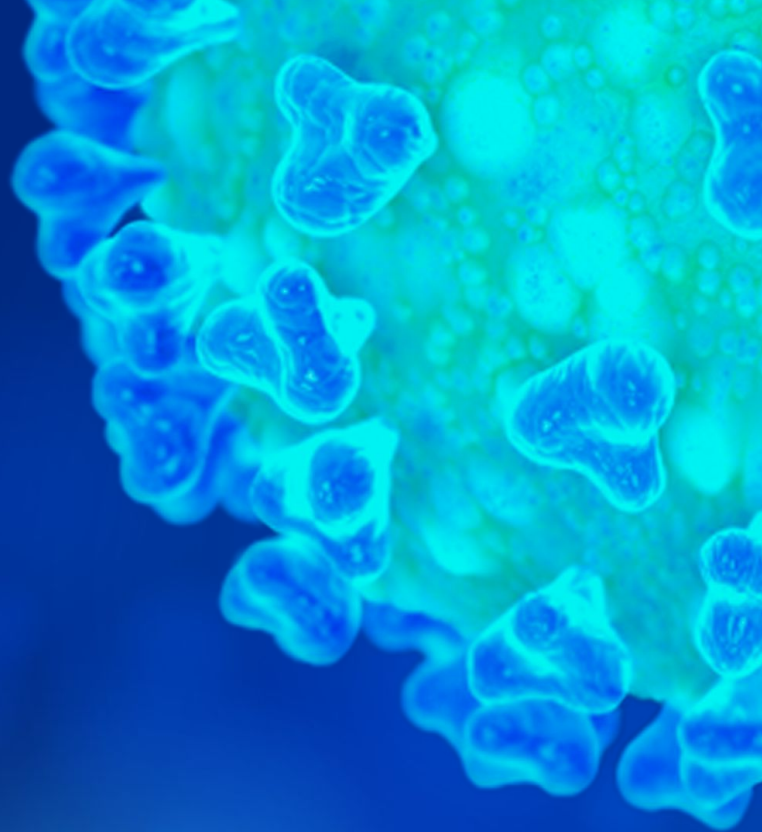
1. Gathered CoughVid cough audio via Zenodo
2. Inspected, scrubbed, and preprocessed coughvid dataset
3. Combined with Virufy audio dataset
- 4.

A microscopic image showing a cluster of cells, likely from a developing embryo, with a greenish-yellow hue. The cells are irregular in shape and have a granular texture. They are located in the top-left corner of the slide.

Further Research:

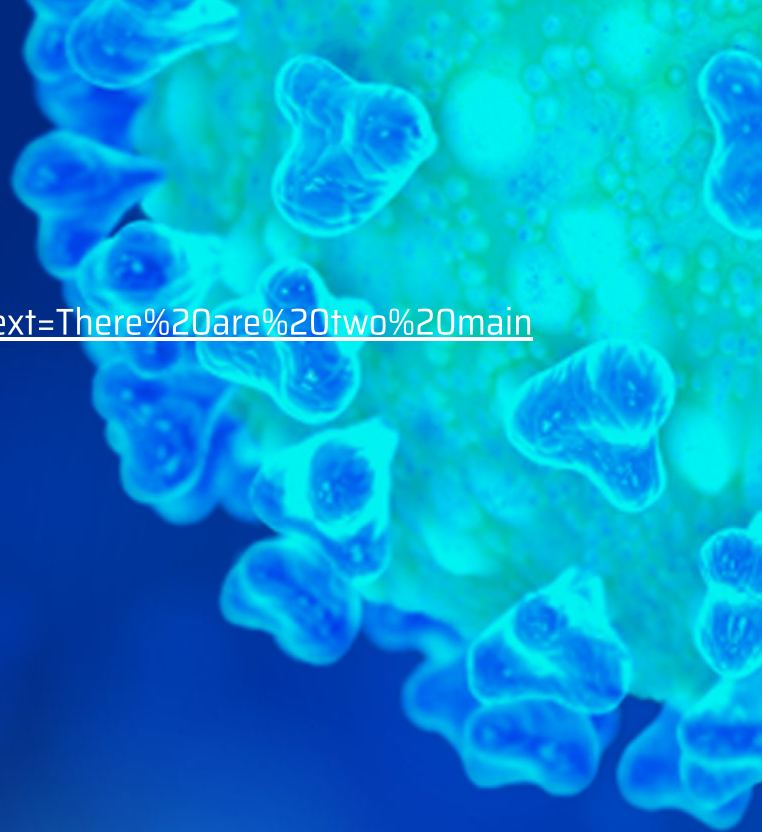
Thanks for your time!

Are there any questions?



References

1. [https://www.vdh.virginia.gov/coronavirus/covid-19-testing/#:~:text=There%20are%20two%20main%20types,\)%20and%20antibody%20tests.](https://www.vdh.virginia.gov/coronavirus/covid-19-testing/#:~:text=There%20are%20two%20main%20types,)%20and%20antibody%20tests.)
- 2.



Appendix

