

Covid19 Detection & Classification



Overview & Business Problem

Overview

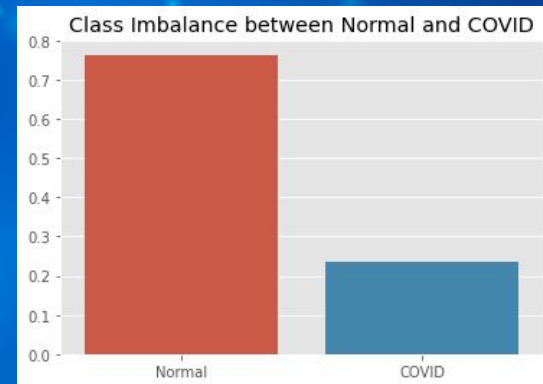
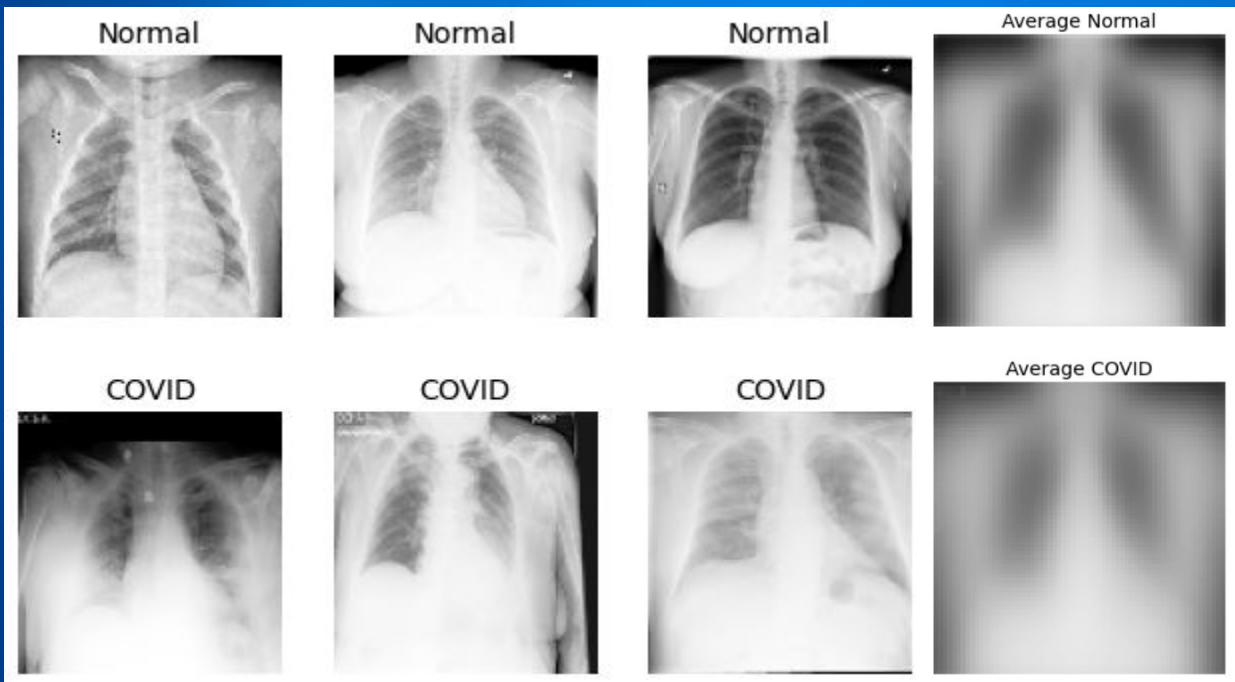
Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease has since spread worldwide, leading to an ongoing pandemic.

So, we built a deep learning model to detect people who infected to COVID-19 virus by using their lung X-ray data from Kaggle. This project will help hospitals figure out infected people when they don't have COVID test kit.

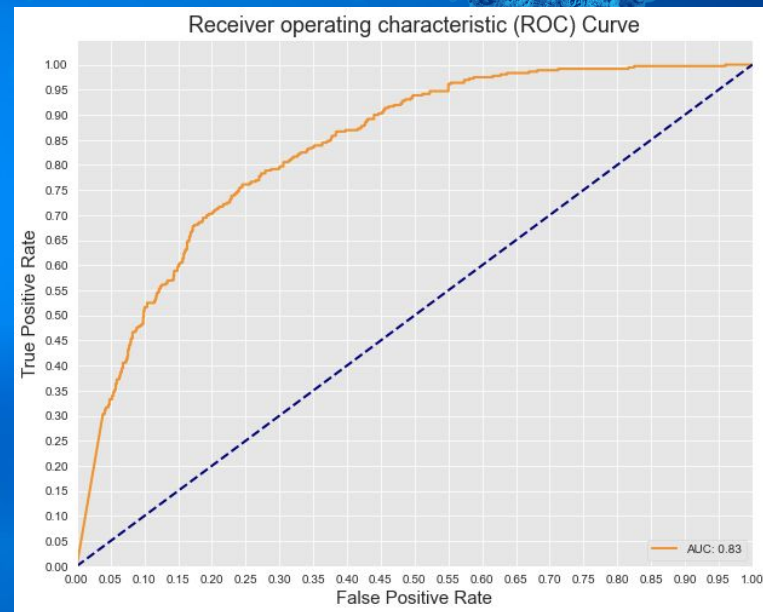
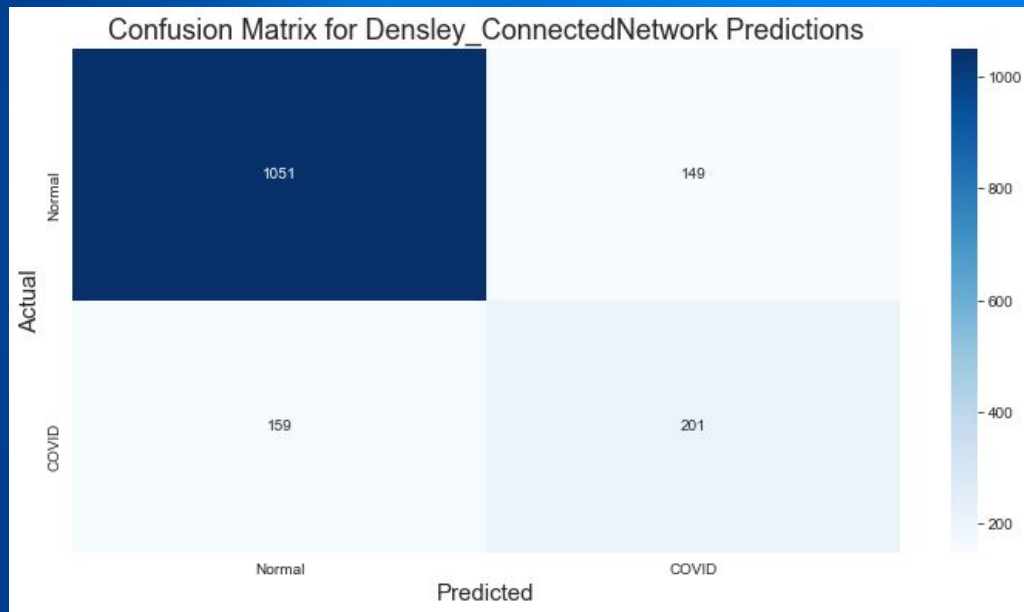
Business Problem

Can we detect infected people to COVID-19 virus by using their lung X-ray image?

Data Exploration

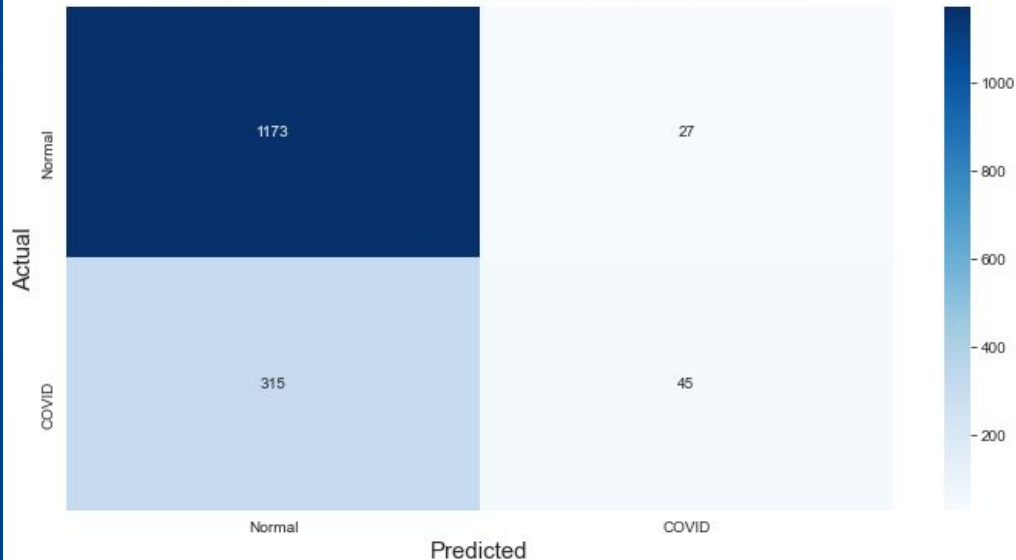


Model 1 - Densely Connected Network Model

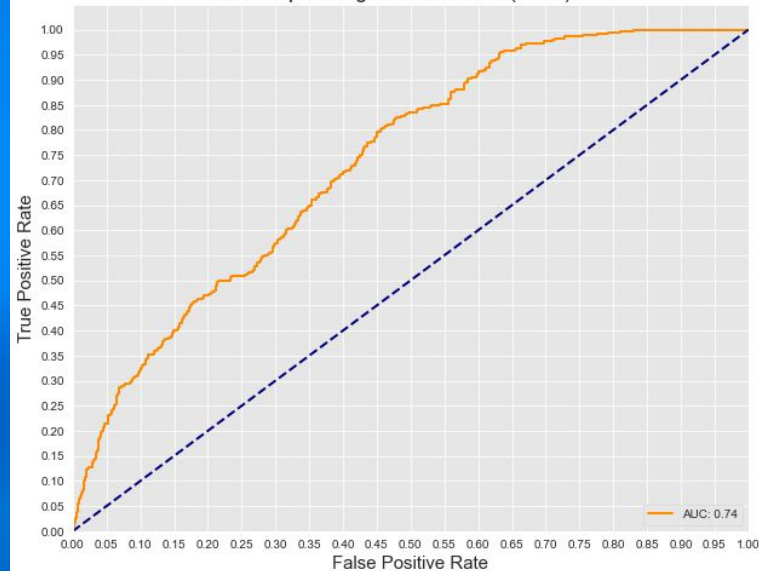


Model 2 - Baseline CNN

Confusion Matrix for BaselineCNN Model Predictions

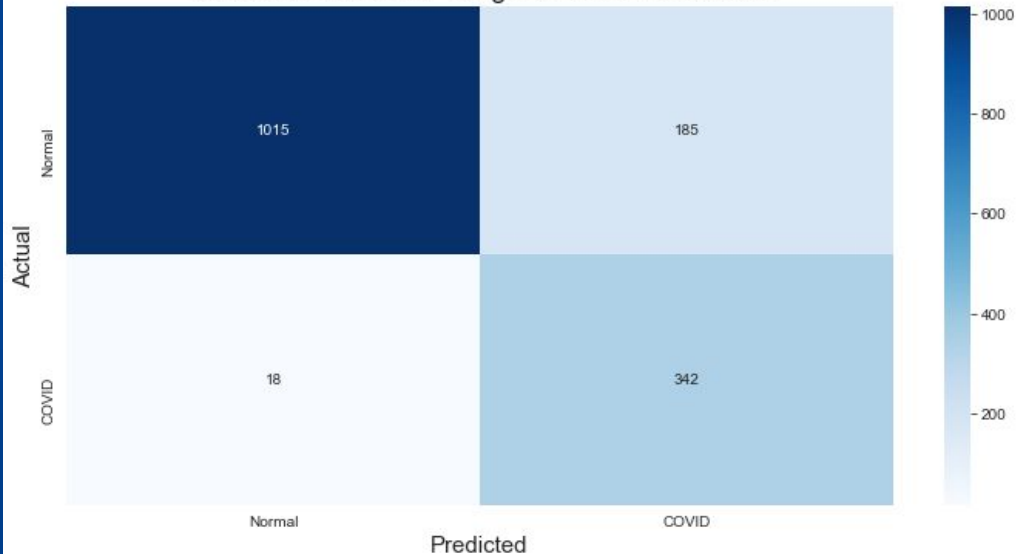


Receiver operating characteristic (ROC) Curve

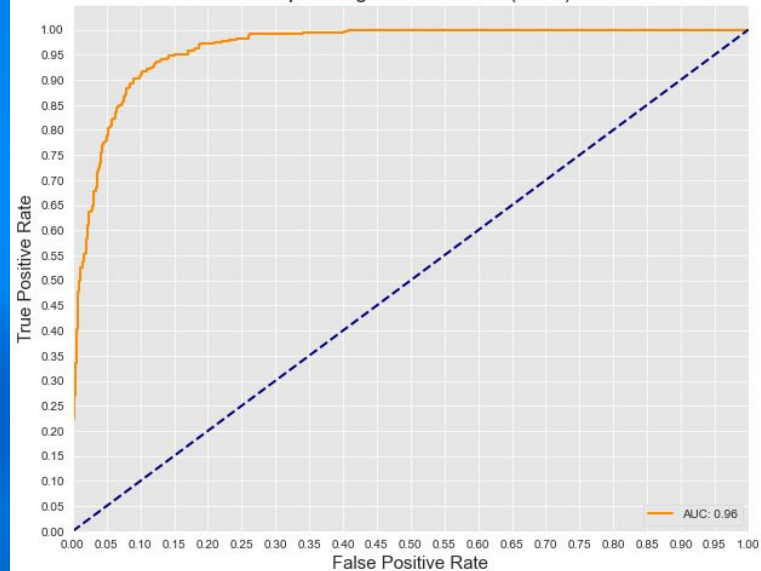


Model 3 - Weighted CNN

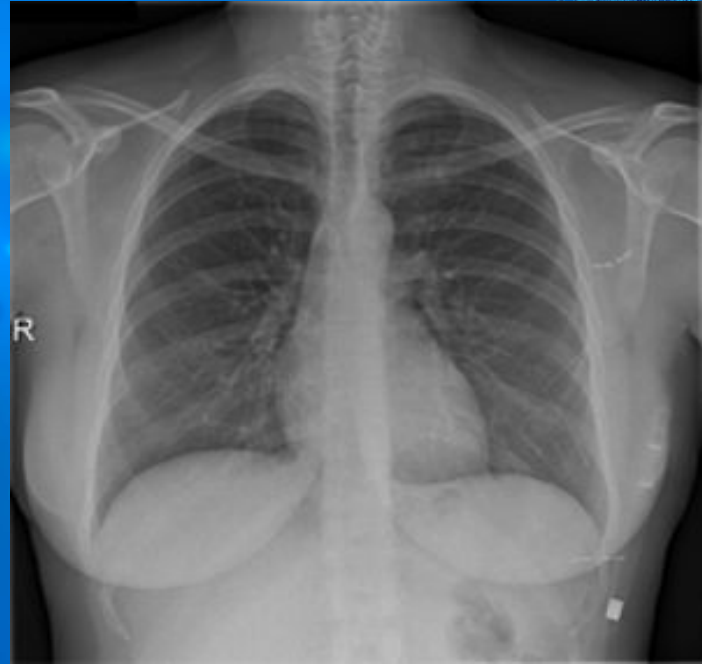
Confusion Matrix for Weighted CNN Predictions



Receiver operating characteristic (ROC) Curve



Which image is COVID-19 infected person's lung?



Conclusion

Best Model

	Weighted CNN
Accuracy	0.87
Precision	0.65
adj.Precision	0.86
Recall	0.95
F1-score	0.77

Conclusion

- We chose weighted CNN model because this model detect COVID-19 well and also detect normal well.
- Our weighted CNN model can be useful as a method of COVID-19 detection for hospitals when they don't have test kit.

Next step

- See if the model can differentiate COVID X-ray images from other lung disease X-ray images such as pneumonia.
- See if we can develop new models to detect other diseases using X-ray images.