Discuss the motivation behind your research project and the problem you are attempting to solve.

As a person that works in health care I understand the uncertainty that covid-19 has on everyday life. One of the major issue. is that hospitals has a difficult time planning on how to divide up medical devices and hospital beds for the infected people. The problem I am trying to solve is to improve the accuracy that predictive models such as LSTM and GRU models has on forecasting daily cases. I hope to do this By adding in factors that is known to influence the transmission rate of the virus. When we are able to forecast the daily cases as close to the real life data as much as possible it will help governments and hospitals plan ahead.

Why is it worth studying?

Upon reading a lot of literature about how different researchers used predictive models to forecast daily cases. I realized that a lot of researchers only used the confirmed cases and deaths to forecast daily cases. I noticed that they don’t include any influential factors into their model. I believe that it is worth studying this because while I was doing my research, I found that wind speed and population density can influence 95% of the transmission rate. I believe that by adding in these two factors we can have a higher accuracy and help hospitals plan ahead.

What did you achieve in your research project

I was able to build a basic LSTM and GRU model using the encoder decoder method to forecast daily cases. I was able to use accuracy to test which model is the better and to see if including the factors has a influence on the accuracy of the model. After creating the LSTM model without the factors, I found that they have a accuracy of 41.38 per cent but while adding in the two factors, the LSTM model increased to 69.34 per cent. While the GRU model had a accuracy of 58.62 per cent without the factors and 69.34 percent with the factors. With this experiment, I found that with the factors, it improved the accuracy significantly. I can also see that GRU model waws the superior model because it had lower mean squared error even though both models showed the same accuracy.

|  |  |
| --- | --- |
| Method | Accuracy |
| LSTM without factors | 41.38% |
| GRU without factors | 58.62% |
| LSTM with factors | 69.34% |
| LSTM with factors | 69.34% |