CSE 847 Machine Learning
Project Proposal

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1 Title

Performance Evaluation of Different Machine Learning Models to Predict COVID-19 Cases from Time Series Data.

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3 Problem Description

The COVID-19 pandemic is leaving a ineradicable mark in the modern civilization. There have been approximately 840,000 deaths in the US alone with tens of thousands of more projected fatalities in 2022.[1] Our goal of this project is to conduct an extensive analysis on the time series data of the dataset curated by the Johns Hopkins University Center for Systems Science and Engineering (JHU CSSE).[2]. We want to apply different machine learning prediction models to predict the spread of the COVID-19 cases in near future. The main motivation to use this dataset is that it is updated every day from countries all around the world including the individual state level data from the United States.

4 Milestones

- Data Collection and Preprocessing
- Attribute Selection
- Model Selection for Time Series Prediction
- Training and Evaluation
- Result Analysis and Performance Evaluation

5 Paper List

1. COVID-19 future forecasting using supervised machine learning models [5]
2. COVID-19 pandemic prediction for Hungary; a hybrid machine learning approach [4]
3. Predictions for COVID-19 with deep learning models of LSTM, GRU and Bi-LSTM [6]
4. Association between weather data and COVID-19 pandemic predicting mortality rate: Machine learning approaches [3]

References

[1] J. Cohen. Predictions 2022: Covid-19 and public health. forbes. `https://www.forbes.com/sites/joshuacohen/2022/01/03/predictions-2022-covid-19-and-public-health/?sh=637428813b4d`, 2022 (accessed February 16, 2022).

[2] Ensheng Dong, Hongru Du, and Lauren Gardner. An interactive web-based dashboard to track covid-19 in real time. *The Lancet infectious diseases*, 20(5):533–534, 2020.

[3] Zohair Malki, El-Sayed Atlam, Aboul Ella Hassanien, Guesh Dagnew, Mostafa A Elhosseini, and Ibrahim Gad. Association between weather data and covid-19 pandemic predicting mortality rate: Machine learning approaches. *Chaos, Solitons & Fractals*, 138:110137, 2020.

[4] Gergo Pinter, Imre Felde, Amir Mosavi, Pedram Ghamisi, and Richard Gloaguen. Covid-19 pandemic prediction for hungary; a hybrid machine learning approach. *Mathematics*, 8(6):890, 2020.

[5] Furqan Rustam, Aijaz Ahmad Reshi, Arif Mehmood, Saleem Ullah, Byung-Won On, Waqar Aslam, and Gyu Sang Choi. Covid-19 future forecasting using supervised machine learning models. *IEEE access*, 8:101489–101499, 2020.

[6] Farah Shahid, Aneela Zameer, and Muhammad Muneeb. Predictions for covid-19 with deep learning models of lstm, gru and bi-lstm. *Chaos, Solitons & Fractals*, 140:110212, 2020.