A Deep Learning Model to Forecast the Impact of COVID-19 on Traffic Demand in Salt Lake County

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The COVID-19 pandemic has had an enormous impact on all facets of life, including transportation. This project investigates the impact of COVID-19 on freeway traffic in Salt Lake County, and seeks to create a model to forecast future traffic flow based on previous data and a combination of factors related to COVID-19, weather, the economy, and government policies. A Long Short-Term Memory (LSTM) model and a Graph Convolutional Network LSTM (GCN-LSTM) were created to predict future traffic demand. The model evaluation reveals that the GCN-LSTM performs well, with a mean absolute percentage error of 2.96%, while the LSTM has a mean absolute percentage error of 3.16%. Although the GCN-LSTM significantly outperforms the benchmark persistence model by 87.10% in terms of mean absolute percentage error, it only slightly outperforms the LSTM, by 6.33% in terms of mean absolute percentage error. Both models can potentially be used by transportation agencies to prepare for changes in traffic demand in the near future.