This paper compares the performance of Long Short Term Memory (LSTM) and Gated Recurrent Units (GRU) neural network methods with the traditional ARIMA model for traffic flow prediction. The experiments conducted using traffic flow data from the PeMS dataset show that both LSTM and GRU outperform ARIMA, with GRU performing slightly better than LSTM. The paper provides a detailed overview of LSTM and GRU cells, experimental design, and performance evaluation.

The paper provides a comprehensive comparison of LSTM, GRU, and ARIMA models for traffic flow prediction, offering valuable insights into the performance of these methods. The experimental results demonstrate that both LSTM and GRU outperform the traditional ARIMA model, providing empirical evidence of the superiority of deep learning methods in this context. The paper offers a detailed overview of the structure and computation of LSTM and GRU cells, which enhances the understanding of these neural network architectures for traffic flow prediction. The paper outlines the experimental design, providing transparency and reproducibility, which is essential for validating the findings and allowing for further research in this area.

The study uses historical average values to impute missing data, which could add bias and reduce the forecast accuracy. The paper's rigor would be improved with an explanation of how this imputation method might affect the results. The paper provides experimental results and comparisons, it lacks a detailed theoretical explanation of why LSTM and GRU models outperform the ARIMA model in the traffic flow prediction. The experiments are based on only one specific dataset from California, which may limit the generalizability of the findings to another places. Experiments could have tested on other real time datasets also. The authors didn’t discuss the computational complexity of the LSTM and GRU models compared to ARIMA model which is important for practical implementation considerations

Future Work Discussion: The report outlines future directions for enhancing the models, demonstrating a proactive stance and laying the groundwork for more studies in this area.