MSc Project Report

Trajectory Planning of the vehicle using Deep learning technique LSTM and Transformer

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Abstract

This research focus of trajectory planning of the vehicle using deep learning techniques Long Short-Term Memory (LSTM) and Transformer. The goal is to find precious trajectory planning model that can predict a vehicle's future position based on its current position, speed, and surrounding vehicle's positions. The system architecture was created, and a requirement analysis was done as next step. The models were constructed using keras, TensorFlow and python, after thorough analysis of the literature of pertinent studies.

 Model was trained on real world highway dataset (highD dataset). Model evaluation was performed by Root Mean Squared Error (RMSE) and Mean Squared Error (MSE) comparison. According to those values Transformer model performed better than LSTM model with lowest MSE and RMSE values, proving that it is capable of accurately capturing long-term dependencies.

The user interface was developed using python and Django framework. To determine the important parties engaged in the suggested system, stakeholder analysis was performed lastly. The ethical, legal, and social issues that must be considered while designing and implementing the system were also recognized and addressed. In conclusion upcoming technology transformers gives better results than LSTM model. For future research also we can try this technology to modify it.