

Route Prediction for a Driver

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Training a model for the Route Prediction is not something new for the Research world. However, I found no Research, which concerns about the features, which are specific to the passengers, in predicting the Route for the journey. As an example, we will consider two geometric points as A and B. Let us assume there are five routes (R1, R2, R3, R4, and R5) to travel between A and B. Client C1 travels daily from A to B with his wife who is working in a company, which meets only if they travel in route R3. However, as R3 is the Route with the highest traffic; client C2 who travels alone in his car prefer Route R1, which has less traffic and so let him to move fast. This is not something imagined but a scenario, which happens in real world. This screams that a model, which was trained with general data (data that are not specific for the user), would not suffice the need 'Route Prediction' accurately. Next problem is the privacy. Collecting one's travel data to a central server is something, which makes him uncomfortable. This research provides the solution for these cases. Here the model has been trained with Federated Learning. First, the central model was trained with a dataset, which was collected from a general sample of the community. Then I have selected three specific clients and collected their Travel Data for two months. Central model was retrained separately for three times with those client data. By the end of the two months each of the three clients, have three different models for Route prediction, which were trained with their own data. This way while each client gets his own model, which is specific to his data, their privacy is also preserving (As their data was collected in their own device). Then model parameters of the three models were averaged and next the central model was created with those averaged values. As I have collected data specifically for the research (Not a previously collected data set), the dataset and so the Research is up to date. Every model was trained with 13 attributes, which were selected by discussing with daily travelers. Considered Travels were limited to the trips which were between Kelaniya, Sri Lanka and Kohuwala, Sri Lanka. A one can understand the whole process of federated learning and specially the productivity of training a model with federated learning by studying this Research. The accuracy of the models trained proves that federated learning suits to train a model for Route Prediction.

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