# **Ola** **Bike Ride Request Forecast**

A Synopsis Submitted

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# **SYNOPSIS**

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1. **Introduction**

The ride-hailing (Ola) service sector has been expanding for a few years, and it is anticipated to continue expanding in near future. Ola drivers must decide where to wait for passengers since they may arrive rapidly. Additionally, passengers like an immediate bike service whenever required. People who have issues with booking Ola bikes, which sometimes cannot be fulfilled or the wait time for the arrival of the trip is particularly lengthy owing to the lack of a nearby Ola bike. If you successfully reserve an Ola bike in one go, consider yourself fortunate. Ola is acquiring a greater market share and significance in a variety of transportation markets. Big data technologies and algorithms should be employed to handle the enormous amounts of information that are available to enhance service efficiency. This will allow for more accurate estimates of efficiency as well as assistance in meeting the needs of riders. This work develops a model to forecast supply and demand mismatches using information from the leading ride-hailing company in Bangalore. The percentage of Indians who travel by taxi, bus, or rail is among the highest in the world and few of the Indians 1.4 million residents own automobiles. The leading ride-hailing business in Bangalore, Ola, handles more than 1 lakh rides daily and gathers more than 5GB of data.

It has become important for Ola (and other e-haling) company to forecast the demand for their Ola bikes so that they may better understand that demand and maximize the efficiency of their fleet management. A novel model based on users' ride request dataset is proposed to address these problems; it would include characteristics such as ride booking time, season, and weather, temp, humidity, windspeed, number of non-registered user rentals initiated, number of registered user rentals initiated, number of ride request raised on the app for that hour. This model will try to predict ride-request for a particular hour using machine learning, assisting the business in maximizing the density of Ola bikes to meet consumer demand.

1. **Literature Review**

Had examined the problem of attempting to forecast the supply-demand gap in ride-sourcing services over the near term. In contrast to the previous studies, which divided a city area into several square lattices, this study divided the city area into a number of regular hexagon lattices. This difference in approach was motivated by the fact that hexagonal segmentation has an unambiguous neighbourhood definition, a smaller edge-to-area ratio, and isotropy. The study proposed three hexagon-based convolutional neural networks (H-CNN), the input and output of which are multiple local hexagon maps, in order to capture the spatiotemporal properties in a hexagonal fashion. A hexagon-based ensemble technique is developed to enhance prediction performance. The H-CNN models are determined to greatly beat the benchmark algorithms in terms of accuracy and robustness after being validated with a 3-week real world ride-sourcing dataset in Guangzhou, China. had developed a model for ride hailing demand forecasting that was based on deep learning to reach high levels of accuracy when dealing with challenges of a similar kind. This also addressed a constraint that is present in previous models for predicting ride hailing demand, which is that the region is organized into a rectangle grid, and all travel demand projections are performed within rectangular cells, rather than inside city neighbourhood zones. The suggested model estimates demand for travel between city neighbourhood zones. The proposed model outperforms the CNN and LSTM models up to 18.41% in RMSE and 22.65% in R2 values, according to trials using a real-world rental car dataset in New York City. had provided several machine learning algorithms in order to characterize and forecast the demand for on demand ride-hailing services in the near future. The spatiotemporal estimate of demand, which is a function of variable effects relating to traffic, price, and environmental factors, was also proposed. In terms of the methods, a single decision tree, bootstrap-aggregated (bagged) decision trees, random forest, boosted decision trees, and an artificial neural network for regression have all been adapted and systematically compared using several different statistics, such as R-square, Root Mean Square Error (RMSE), and slope. With an aggregated-time interval of ten minutes, 199,584 time-slots that describe the spatial-temporal ride hailing demand have been extracted from the data. Based on two independent samples from this dataset, all techniques are trained and validated. The findings showed that boosted decision trees, artificial neural networks, random forests, bagged decision trees, and single decision trees all provide the greatest prediction accuracy while minimizing the danger of over-fitting.

1. **Proposed Work**

Ride hailing companies (such as Ola) are losing money and market share to their competitors, due to their failure to satisfy the trip demands of many consumers. To solve this issue, a novel model is presented out to predict ride-request for a particular hour using machine learning.

Dataset: The data set used in this study was a ride request dataset. This dataset would have the following attributes: ride booking time, season, and weather, temp, humidity, windspeed, number of non-registered user rentals initiated, number of registered user rentals initiated, number of ride request raised on the app for that hour. Explanation for the column names in the dataset and their values is as follows:

**season-**

1. spring
2. summer
3. fall
4. winter

### **weather-**

1. Clear, Few clouds, Partly cloudy, Partly cloudy
2. Mist + Cloudy, Mist + Broken clouds, Mist + Few clouds, Mist
3. Light Snow, Light Rain + Thunderstorm + Scattered clouds, Light Rain + Scattered clouds
4. Heavy Rain + Ice Pallets + Thunderstorm + Mist, Snow + Fog

**casual**– number of non-registered user rentals initiated  
 **registered**– number of registered user rentals initiated  
 **count**– number of ride request raised on the app for that hour.

Data Preparation: There are times when multiple features are provided in the same feature or we must derive some features from the existing ones. I will also try to include some extra features in our dataset so, that we can derive some interesting insights from the data we have. Also, if the features derived are meaningful then they become a deciding factor in increasing the model’s accuracy significantly.

## Exploratory Data Analysis

[**EDA**](https://www.geeksforgeeks.org/what-is-exploratory-data-analysis/) is an approach to analysing the data using visual techniques. It is used to discover trends, and patterns, or to check assumptions with the help of statistical summaries and graphical representations.

I will add some features to our dataset using some assumptions. And will also check what are the relations between different features with the target feature.

## Model Training

Will separate the features and target variables and split them into training and the testing data by using which I will select the model which is performing best on the [validation data](https://www.geeksforgeeks.org/training-vs-testing-vs-validation-sets/).

I will split the data into training and validation data also the normalization of the data will be done. I will train some state-of-the-art machine learning models and select the best out of them using the validation dataset.

**References**

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[3] https://www.projectpro.io/project-use-case/ola-bike-rides-request-demand-forecast