

CLAIMS

1. A server configured to determine an advanced booking fee for an advance booking, the server comprising:
 - one or more processor(s); and
 - a memory having instructions stored therein, the instructions, when executed by the one or more processor(s), cause the one or more processor(s) to:
 - receive an advanced booking enquiry over a communication network from a user device for a predetermined transportation service at a predetermined future time from a service provider;
 - generate a predetermined fare price of the advance booking through a quantile regression neural network trained on historical data of similar historical bookings stored in a database of the server;
 - determine a potential future trip price through Importance Sampling of historical data of similar historical bookings with a higher price than the predetermined fare price of the advance booking, using a nonlinear transformation;
 - determine a call option price based on a difference between the predetermined fare price of the advance booking and the potential future trip price;
 - determine an earning adjustment for the service provider to provide the predetermined transportation service at the predetermined future time; and
 - determine the advanced booking fee for the predetermined transportation service at the predetermined future time based on the call option price and the earning adjustment, wherein the call option price is non-refundable and the earning adjustment is refundable upon cancellation of the advance booking.
2. The server of claim 1, wherein the one or more processor(s) is configured to:
 - determine a probability of the potential future trip price being higher than the predetermined fare price; and
 - determine the call option price based on the difference between the predetermined fare price of the advance booking and the potential future trip price, and the probability.

3. The server of claim 1 or claim 2, wherein the one or more processor(s) is configured to determine a lock-in time before the predetermined future time in which the service provider will not be able to accept another booking.
4. The server of claim 3, wherein the one or more processor(s) is configured to:
 - determine potential geohashes of the service provider at the lock-in time based on a pick-up location of the advance booking; and
 - determine surrounding geohashes of the potential geohashes of the service provider at the lock-in time.
5. The server of claim 4, wherein the one or more processor(s) is configured to:
 - determine an earning rate of the service provider for each surrounding geohashes at the lock-in time; and
 - determine a probability of the service provider accepting a booking for each of the surrounding geohashes at the lock-in time.
6. The server of claim 5, wherein the one or more processor(s) is configured to:
 - determine the earning adjustment for the service provider to provide the predetermined transportation service at the predetermined future time based on the lock-in time, the earning rate for each surrounding geohashes, and the probability of the service provider accepting a booking for each of the surrounding geohashes.
7. A method of determining an advanced booking fee for an advance booking comprising
 - using one or more processor(s) of a server to:
 - receive an advanced booking enquiry over a communication network from a user device for a predetermined transportation service at a predetermined future time from a service provider;
 - generate a predetermined fare price of the advance booking through a quantile regression neural network trained on historical data of similar historical bookings stored in a database of the server;

determine a potential future trip price through Importance Sampling of historical data of similar historical bookings with a higher price than the predetermined fare price of the advance booking, using a nonlinear transformation

determine a call option price based on a difference between the predetermined fare price of the advance booking and the potential future trip price;

determine an earning adjustment for the service provider to provide the predetermined transportation service at the predetermined future time; and

determine the advanced booking fee for the predetermined transportation service at the predetermined future time based on the call option price and the earning adjustment, wherein the call option price is non-refundable and the earning adjustment is refundable upon cancellation of the advance booking.

8. The method of claim 7, further comprising using the one or more processor(s) to:
 - determine a probability of the potential future trip price being higher than the predetermined fare price; and
 - determine the call option price based on the difference between the predetermined fare price of the advance booking and the potential future trip price, and the probability.
9. The method of claim 7 or claim 8, further comprising using the one or more processor(s) to:
 - determine a lock-in time before the predetermined future time in which the service provider will not be able to accept another booking.
10. The method of claim 9, further comprising using the one or more processor(s) to:
 - determine potential geohashes of the service provider at the lock-in time based on a pick-up location of the advance booking; and
 - determine surrounding geohashes of the potential geohashes of the service provider at the lock-in time.
11. The method of claim 10, further comprising using the one or more processor(s) to:
 - determine an earning rate of the service provider for each surrounding geohashes at the lock-in time; and

determine a probability of the service provider accepting a booking for each of the surrounding geohashes at the lock-in time.

12. The method of claim 11, further comprising using the one or more processor(s) to:
determine the earning adjustment for the service provider to provide the predetermined transportation service at the predetermined future time based on the lock-in time, the earning rate for each surrounding geohashes, and the probability of the service provider accepting a booking for each of the surrounding geohashes.
13. A non-transitory computer-readable medium storing computer executable code comprising instructions for determining an advanced booking fee for an advance booking according to the method of any one of claims 7 to 12.