SYSTEMS AND METHODS FOR DETERMINING PREDICTED DISTRIBUTION OF FUTURE TRANSPORTATION SERVICE TIME POINT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Application No. 201610122417.4 filed on March 3, 2016, the content of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] The present disclosure generally relates to systems and methods for on-demand service, and in particular, systems and methods for determining a predicted distribution of future transportation service time point.

BACKGROUND

[0003] With the development of Internet technology, on-demand transportation services, such as online taxi hailing services, have become more and more popular. The demand for transportation services may be large in traffic peak period, whereas in idle period, the demand may be small. Under some situations, it may be difficult to meet the demand for transportation services efficiently.

SUMMARY

[0004] According to some examples of the present disclosure, a system may include one or more storage media and one or more processors configured to communicate with the one or more storage media. The one or more storage media may include a set of instructions for determining a predicted distribution of future transportation service time point. When the one or more processors executing the set of instructions, the one or more processors may be directed to perform one or more of the following operations. The one or more processors may obtain historical service time points of transportation service requests occurred in a predetermined region. The one or more processors may determine a variance of the historical service time points. The one or more processors may determine a predicted distribution of future transportation service time point in the predetermined region based on the variance. The one or

[0012] In some embodiments, the one or more processors may obtain a plurality of variance values based on the fluctuation range relating to the variance. The one or more processors may determine a first predicted distribution of future transportation service time point based on the variance value for each of the plurality of variance values. The one or more processors may then determine a second predicted distribution of future transportation service time point based on a plurality of first predicted distributions of future transportation service time point.

[0013] In some embodiments, the one or more processors may determine an expectation of the historical service time points. The one or more processors may determine a normal distribution based on the expectation and the variance value. The one or more processors may then determine the first predicted distribution of future transportation service time point based on the normal distribution.

[0014] In some embodiments, the one or more processors may weigh the plurality of first predicted distributions of future transportation service time point. The one or more processors may then determine the second predicted distribution of future transportation service time point based on the weighing result.

[0015] According to some examples of the present disclosure, a method may include one or more of the following operations. A computer may obtain historical service time points of transportation service requests occurred in a predetermined region. The computer server may determine a variance of the historical service time points. The computer server may determine a predicted distribution of future transportation service time point in the predetermined region based on the variance. The computer server may then store the predicted distribution in a database.

[0016] In some embodiments, the computer server may receive a request of a transportation service frequency that is associated with a first predetermined time period from a user terminal. The computer server may obtain a result transportation service frequency by applying the first predetermined time period to the predicted distribution. The computer server may then send the result transportation service frequency to the user terminal.

[0017] In some embodiments, the computer server may determine an average service time point of the historical service time points. The computer server may determine the number of the historical service time points. The computer server may then determine the variance of the

on the expectation and the variance value. The computer server may then determine the first predicted distribution of future transportation service time point based on the normal distribution.

[0025] In some embodiments, the computer server may weigh the plurality of first predicted distributions of future transportation service time point. The computer server may then determine the second predicted distribution of future transportation service time point based on the weighing result.

[0025a] In view of the above, according to a first aspect of the present disclosure, there is provided a system. The system comprises: a bus; one or more storage media electronically connected to the bus, including a set of instructions for determining a predicted distribution of future transportation service time point; and logic circuits electronically connected to the at least one storage medium via the bus. During operation, the logic circuits load the set of instructions and: obtain electronic signals from the bus, the electronic signals encoding historical service time points of transportation service requests occurred in a predetermined region; determine a variance of the historical service time points; determine a predicted distribution of future transportation service time point in the predetermined region based on the variance; and store the predicted distribution in a database.

[0025b] According to a second aspect of the present disclosure, there is provided a method. The method comprises: obtaining, by at least one electronic device, historical service time points of transportation service requests occurred in a predetermined region; determining, by the at least one electronic device, a variance of the historical service time points; determining, by the at least one electronic device, a predicted distribution of future transportation service time point in the predetermined region based on the variance; and storing, by the at least one electronic device, the predicted distribution in a database.

[0026] Additional features will be set forth in part in the description which follows, and in part will become apparent to those skilled in the art upon examination of the following and the accompanying drawings or may be learned by production or operation of the examples. The features of the present disclosure may be realized and attained by practice or use of various aspects of the methodologies, instrumentalities and combinations set forth in the detailed examples discussed below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The present disclosure is further described in terms of exemplary embodiments. These exemplary embodiments are described in detail with reference to the drawings. These embodiments are non-limiting exemplary embodiments, in which like reference numerals represent similar structures throughout the several views of the drawings, and wherein:

[0028] FIG. 1 is a schematic diagram illustrating an exemplary on-demand service system according to some embodiments of the present disclosure;

[0029] FIG. 2 is a block diagram illustrating an exemplary computing device in the on-demand service system according to some embodiments of the present disclosure;

[0030] FIG. 3 is a block diagram illustrating an exemplary processing engine according to some embodiments of the present disclosure;

[0031] FIG. 4 is a flowchart illustrating an exemplary process/method for determining a predicted distribution of future transportation service time point according to some embodiments of the present disclosure;

[0032] FIG. 5 is a flowchart illustrating an exemplary process/method for determining a predicted distribution of future transportation service time point according to some

CLAIMS

1. A system, comprising:

a bus;

one or more storage media electronically connected to the bus, including a set of instructions for determining a predicted distribution of future transportation service time point; and

logic circuits electronically connected to the at least one storage medium via the bus, wherein during operation, the logic circuits load the set of instructions and:

obtain electronic signals from the bus, the electronic signals encoding historical service time points of transportation service requests occurred in a predetermined region;

determine a variance of the historical service time points;

determine a predicted distribution of future transportation service time point in the predetermined region based on the variance; and

store the predicted distribution in a database.

2. The system of claim 1, wherein the logic circuits further:

receive a request of a transportation service frequency that is associated with a first predetermined time period from a user terminal;

obtain a result transportation service frequency by applying the first predetermined time period to the predicted distribution; and

send out electronic signals encoding the result transportation service frequency to the user terminal.

3. The system of claim 1, wherein to determine the variance of the historical service time points, the logic circuits further::

determine an average service time point of the historical service time points;

determine the number of the historical service time points; and

determine the variance of the historical service time points based on the average service time point of the historical service time points and the number of the historical service time points.

4. The system of claim 3, wherein to determine the variance of the historical service time points, the logic circuits further::

determine that the number of historical transportation service requests in a second predetermined time period is smaller than a first threshold value, so that accuracy of the predicted distribution of future transportation service time point is lower than a second threshold value;

determine a correction coefficient relating to the number of the historical service time points; and

apply the correction coefficient to the variance of the historical service time points to increase prediction accuracy.

5. The system of claim 3, wherein to determine the predicted distribution of future transportation service time point based on the variance, the logic circuits further::

determine a fluctuation range relating to the variance; and

determine the predicted distribution of future transportation service time point based on the fluctuation range.

6. The system of claim 5, wherein to determine the fluctuation range relating to the variance, the logic circuits further:

determine a standard deviation of the historical service time points;

determine a distribution model relating to the variance based on the variance, the standard deviation, and the number of the historical service time points; and

determine the fluctuation range relating to the variance based on the distribution model.

7. The system of claim 6, wherein the distribution model is a distribution model relating to a quadratic sum of multiple normal distribution variables.

8. The system of claim 5, wherein to determine the predicted distribution of future transportation service time point based on the variance, the one or more processors are directed to:

obtain a plurality of variance values based on the fluctuation range relating to the

variance;

for each of the plurality of variance values, determine a first predicted distribution of future transportation service time point based on the variance value; and

determine a second predicted distribution of future transportation service time point based on a plurality of first predicted distributions of future transportation service time point.

9. The system of claim 8, wherein to determine the first predicted distribution of future transportation service time point based on the variance value, the logic circuits further:

determine an expectation of the historical service time points;

determine a normal distribution based on the expectation and the variance value; and

determine the first predicted distribution of future transportation service time point based on the normal distribution.

10. The system of claim 8, wherein to determine the second predicted distribution of future transportation service time point, the logic circuits further:

weigh the plurality of first predicted distributions of future transportation service time point; and

determine the second predicted distribution of future transportation service time point based on the weighing result.

11. A method, comprising:

obtaining, by at least one electronic device, historical service time points of transportation service requests occurred in a predetermined region;

determining, by the at least one electronic device, a variance of the historical service time points;

determining, by the at least one electronic device, a predicted distribution of future transportation service time point in the predetermined region based on the variance; and

storing, by the at least one electronic device, the predicted distribution in a database.

12. The method of claim 11, wherein the method further includes:

receiving, by the at least one electronic device, a request of a transportation service

frequency that is associated with a first predetermined time period from a user terminal;

obtaining, by the at least one electronic device, a result transportation service frequency by applying the first predetermined time period to the predicted distribution; and

sending, by the at least one electronic device, the result transportation service frequency to the user terminal.

13. The method of claim 11, wherein the determining of the variance of the historical service time points includes:

determining, by the at least one electronic device, an average service time point of the historical service time points;

determining, by the at least one electronic device, the number of the historical service time points; and

determining, by the at least one electronic device, the variance of the historical service time points based on the average service time point of the historical service time points and the number of the historical service time points.

14. The method of claim 13, wherein the determining of the variance of the historical service time points includes:

determining, by the at least one electronic device, that the number of historical transportation service requests in a second predetermined time period is smaller than a first threshold value, so that accuracy of the predicted distribution of future transportation service time point is lower than a second threshold value;

determining, by the at least one electronic device, a correction coefficient relating to the number of the historical service time points; and

applying, by the at least one electronic device, the correction coefficient to the variance of the historical service time points to increase prediction accuracy.

15. The method of claim 13, wherein the determining of the predicted distribution of future transportation service time point based on the variance includes:

determining, by the at least one electronic device, a fluctuation range relating to the variance; and

determining, by the at least one electronic device, the predicted distribution of future transportation service time point based on the fluctuation range.

16. The method of claim 15, wherein the determining of the fluctuation range relating to the variance includes:

determining, by the at least one electronic device, a standard deviation of the historical service time points ;

determining, by the at least one electronic device, a distribution model relating to the variance based on the variance, the standard deviation, and the number of the historical service time points; and

determining, by the at least one electronic device, the fluctuation range relating to the variance based on the distribution model.

17. The method of claim 16, wherein the distribution model is a distribution model relating to a quadratic sum of multiple normal distribution variables.

18. The method of claim 15, wherein the determining of the predicted distribution of future transportation service time point based on the variance includes:

obtaining, by the at least one electronic device, a plurality of variance values based on the fluctuation range relating to the variance;

for each of the plurality of variance values, determining, by the at least one electronic device, a first predicted distribution of future transportation service time point based on the variance value; and

determining, by the at least one electronic device, a second predicted distribution of future transportation service time point based on a plurality of first predicted distributions of future transportation service time point.

19. The method of claim 18, wherein the determining of the first predicted distribution of future transportation service time point based on the variance value includes:

determining, by the at least one electronic device, an expectation of the historical service time points;

determining, by the at least one electronic device, a normal distribution based on the expectation and the variance value; and

determining, by the at least one electronic device, the first predicted distribution of future transportation service time point based on the normal distribution.

20. The method of claim 18, wherein the determining of the second predicted distribution of future transportation service time point includes:

weighing, by the at least one electronic device, the plurality of first predicted distributions of future transportation service time point; and

determining, by the at least one electronic device, the second predicted distribution of future transportation service time point based on the weighing result.