likelihood that the user will get an accommodation through the accommodation reservation system.

SUMMARY

[0004a] According to a first aspect, there is provided a computer implemented method, comprising: identifying a plurality of past booking requests for accommodations listed by hosts on a reservation platform, each of the booking requests having a plurality of features including (i) an identity of the host of the accommodation being requested, (ii) a date range associated with the booking request, (iii) a geographic region associated with the booking request, and (iv) whether the booking request was accepted or rejected by the host of the accommodation; training a predictive computer model based on values of the plurality of features of the booking requests, the predictive computer model comprising, for each of the accommodations, a probability function that represents a relationship between at least one characteristic of a given day of the year and availability of the accommodation on that day; receiving, by the computer, a search query from a guest for accommodation, the search query comprising a geographical location and a requested date range; identifying, by the computer, a set of candidate accommodations in the geographical location that are not booked during the requested date range, each of the candidate accommodations associated with an availability calendar that is maintained by a host of the accommodation and indicates that the candidate accommodation is not booked during the date range; for each of the candidate accommodations, calculating, by the computer applying the predictive computer model to the requested date range, a predicted availability that indicates a likelihood that the candidate accommodation that is not booked during the requested date range according to the availability calendar is actually available for booking during the requested date range; ranking the candidate accommodations in the set based at least on their respective predicted availabilities; and providing the ranked candidate accommodations to the guest in a user interface provided by the reservation system.

[0004b] According to a second aspect, there is provided an accommodation reservation system, comprising: a computer processor; a module executed by the processor and configured to: identify a plurality of past booking requests for accommodations listed by hosts on a reservation platform, each of the booking requests having a plurality of features including (i) an identity of the host of the accommodation being requested, (ii) a date range associated with the booking request, (iii) a geographic region associated with the booking request, and (iv) whether the booking request was accepted or rejected by the host of the accommodation; train a predictive computer model based on values of the plurality of features of the booking requests, the predictive computer model comprising, for each of the accommodations, a probability function that represents a relationship between at least one characteristic of a given day of the year and availability of the accommodation on that day;

receive a search query from a guest, the search query comprising a geographical location and a requested date range; identify a set of candidate accommodations in the geographical location that are not booked during the requested date range, each of the candidate accommodations associated with an availability calendar that is maintained by a host of the accommodation and indicates that the candidate accommodation is not booked during the date range; for each of the candidate accommodations, calculate a predicted availability that indicates a likelihood that candidate the accommodation that is not booked during the requested date range according to the availability calendar is actually available for booking during the requested date range; rank the candidate accommodations in the set based at least on their respective probabilities predicated availabilities; and provide the ranked candidate accommodations to the guest in a user interface provided by the reservation system.

[0004c] According to a third aspect, there is provided a computer program product comprising a computer-readable storage medium containing computer program code for booking accommodation, the computer program code when executed by a processor causes the processor to: dentify a plurality of past booking requests for accommodations listed by hosts on a reservation platform, each of the booking requests having a plurality of features including (i) an identity of the host of the accommodation being requested, (ii) a date range associated with the booking request, (iii) a geographic region associated with the booking request, and (iv) whether the booking request was accepted or rejected by the host of the accommodation; train a predictive computer model based on values of the plurality of features of the booking requests, the predictive computer model comprising, for each of the accommodations, a probability function that represents a relationship between at least one characteristic of a given day of the year and availability of the accommodation on that day; receive a search query from a guest, the search query comprising a geographical location and a requested date range; identify a set of candidate accommodations in the geographical location that are not booked during the requested date range, each of the candidate accommodations associated with an availability calendar that is maintained by a host of the accommodation and indicates that the candidate accommodation is not booked during the date range; for each of the candidate accommodations, calculate a predicted availability that indicates a likelihood that the candidate accommodation that is not booked during the date requested range according to the availability calendar is actually available for booking during the requested date range; rank the candidate accommodations in the set based at least on their respective predicated availabilities; and provide the ranked candidate accommodations to the guest in a user interface provided by the reservation system.

[0005] An accommodation reservation system can predict the availability of an accommodation for a given period of time, based on the accommodation's current listed

availability and the past behavior of the accommodation's host in updating the availability information for the accommodation. In one embodiment, the accommodation reservation system uses a machine learned predictive model, herein called an availability model, to predict the availability of an accommodation.

[0006] The accommodation reservation system can also estimate a probability that, provided an accommodation is available, the guest's request for accommodation is going to be accepted by the host. In one embodiment, the accommodation reservation systems uses another machine learned predictive model, herein called an acceptance model, to predict the likelihood of acceptance based on information about the guest, information about the trip, and the host past behavior in accepting or declining accommodation requests.

[0007] Embodiments of the invention can also use the availability model and the acceptance model to rank the listings returned in response to a search query. Given a set of accommodations that satisfy a user's request for accommodations, the accommodation reservation system ranks higher all the accommodations that a guest is most likely to be able to obtain or book, using a function of the outputs of the availability model and the acceptance model. Other embodiments use those models to filter the search result and only display the listing with an availability probability and/or acceptance probability larger than a threshold.

[0008] The features and advantages described in this summary and the following detailed description are not all-inclusive. Many additional features and advantages will be apparent to one of ordinary skill in the art in view of the drawings, specification, and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a system diagram of the accommodation reservation system, in accordance with an embodiment of the invention.

[0010] FIG. 2 is a block diagram illustrating the different modules inside the accommodation reservation system, in accordance with an embodiment of the invention.

[0011] FIG. 3 is an illustration of the class diagram of the accommodation reservation system, in accordance with an embodiment of the invention.

CLAIMS

1. A computer implemented method, comprising:

identifying a plurality of past booking requests for accommodations listed by hosts on a reservation platform, each of the booking requests having a plurality of features including (i) an identity of the host of the accommodation being requested, (ii) a date range associated with the booking request, (iii) a geographic region associated with the booking request, and (iv) whether the booking request was accepted or rejected by the host of the accommodation;

training a predictive computer model based on values of the plurality of features of the booking requests, the predictive computer model comprising, for each of the accommodations, a probability function that represents a relationship between at least one characteristic of a given day of the year and availability of the accommodation on that day;

receiving, by the computer, a search query from a guest for accommodation, the search query comprising a geographical location and a requested date range;

identifying, by the computer, a set of candidate accommodations in the geographical location that are not booked during the requested date range, each of the candidate accommodations associated with an availability calendar that is maintained by a host of the accommodation and indicates that the candidate accommodation is not booked during the date range;

for each of the candidate accommodations, calculating, by the computer applying the predictive computer model to the requested date range, a predicted availability that indicates a likelihood that the candidate accommodation that is not booked during the requested date range according to the availability calendar is actually available for booking during the requested date range;

ranking the candidate accommodations in the set based at least on their respective predicted availabilities; and

providing the ranked candidate accommodations to the guest in a user interface provided by the reservation system.

2. The computer implemented method of claim 1, wherein the past booking requests were made at most a threshold number of days in the past.

3. The computer implemented method of claim 1, wherein calculating the predicted availability is based on a day of a week the accommodation is requested for.

4. The computer implemented method of claim 1, wherein calculating the predicted availability is based on a month the accommodation is requested for.

5. The computer implemented method of claim 1, wherein calculating the predicted availability is based on whether the day the accommodation was requested for is a holiday.

6. The computer implemented method of claim 1, further comprising:

for each of the candidate accommodations, calculating a probability of booking acceptance that indicates a likelihood that an acceptance will be received from the host of the accommodation in response to a booking request received from the guest, the probability of booking acceptance for an accommodation in the set being based upon the predicted availability for that accommodation.

7. The computer implemented method of claim 6, wherein ranking, by the computer, the candidate accommodations is further based on the probabilities of booking acceptance calculated for the candidate accommodations.

8. The computer implemented method of claim 6, wherein the probability of booking acceptance is calculated based on booking requests made for a number of days in the past.

9. The computer implemented method of claim 6, wherein the probability of booking acceptance is calculated based on booking requests made for a number of days in the past with a probability of availability greater than a threshold.

10. The computer implemented method of claim 6, wherein the probability of booking acceptance is based on one or more properties of the guest searching for accommodation.

11. The computer implemented method of claim 6, wherein the probability of booking acceptance is based on one or more properties of the host associated with the accommodation.

12. An accommodation reservation system, comprising:

a computer processor;

a module executed by the processor and configured to:

identify a plurality of past booking requests for accommodations listed by hosts on a reservation platform, each of the booking requests having a plurality of features including (i) an identity of the host of the accommodation being requested, (ii) a date range associated with the booking request, (iii) a geographic region associated with the booking request, and (iv) whether the booking request was accepted or rejected by the host of the accommodation;

train a predictive computer model based on values of the plurality of features of the booking requests, the predictive computer model comprising, for each of the accommodations, a probability function that represents a relationship between at least one characteristic of a given day of the year and availability of the accommodation on that day;

receive a search query from a guest, the search query comprising a geographical location and a requested date range;

identify a set of candidate accommodations in the geographical location that are not booked during the requested date range, each of the candidate accommodations associated with an availability calendar that is maintained by a host of the accommodation and indicates that the candidate accommodation is not booked during the date range;

for each of the candidate accommodations, calculate a predicted availability that indicates a likelihood that candidate the accommodation that is not booked during the requested date range according to the availability calendar is actually available for booking during the requested date range;

rank the candidate accommodations in the set based at least on their respective probabilities predicated availabilities; and

provide the ranked candidate accommodations to the guest in a user interface provided by the reservation system.

13. The accommodation reservation system of claim 12, wherein calculating the predicted availability is based at least on one selected from the group consisting of a day of a week the accommodation is requested for, a month the accommodation is requested for, and whether the day the accommodation was requested for is a holiday.

14. The accommodation reservation system of claim 12, further comprising:

for each of the candidate accommodations, calculating a probability of booking acceptance that indicates a likelihood that an acceptance will be received from the host of the accommodation in response to a booking request received from the guest, the probability of booking acceptance for an accommodation in the set being based upon the predicted availability for that accommodation.

15. The accommodation reservation system of claim 14, wherein the probability of booking acceptance is calculated based on booking requests made for a number of days in the past.

16. The accommodation reservation system of claim 14, wherein the probability of booking acceptance is calculated based on booking requests made for a number of days in the past with a probability of availability greater than a threshold.

17. The accommodation reservation system of claim 14, wherein the probability of booking acceptance is based on one or more properties of the guest searching for accommodation.

18. The accommodation reservation system of claim 14, wherein the probability of booking acceptance is based on one or more properties of the host associated with the accommodation.

19. A computer program product comprising a computer-readable storage medium containing computer program code for booking accommodation, the computer program code when executed by a processor causes the processor to:

identify a plurality of past booking requests for accommodations listed by hosts on a reservation platform, each of the booking requests having a plurality of features including (i) an identity of the host of the accommodation being requested, (ii) a date range associated with the

booking request, (iii) a geographic region associated with the booking request, and (iv) whether the booking request was accepted or rejected by the host of the accommodation;

train a predictive computer model based on values of the plurality of features of the booking requests, the predictive computer model comprising, for each of the accommodations, a probability function that represents a relationship between at least one characteristic of a given day of the year and availability of the accommodation on that day;

receive a search query from a guest, the search query comprising a geographical location and a requested date range;

identify a set of candidate accommodations in the geographical location that are not booked during the requested date range, each of the candidate accommodations associated with an availability calendar that is maintained by a host of the accommodation and indicates that the candidate accommodation is not booked during the date range;

for each of the candidate accommodations, calculate a predicted availability that indicates a likelihood that the candidate accommodation that is not booked during the date requested range according to the availability calendar is actually available for booking during the requested date range;

rank the candidate accommodations in the set based at least on their respective predicated availabilities ; and

provide the ranked candidate accommodations to the guest in a user interface provided by the reservation system.

20. The computer program product of claim 19, wherein the booking requests were made at most a threshold number of days in the past.

21. The computer program product of claim 20, wherein calculating the predicted availability is based at least on one selected from the group consisting of a day of a week the accommodation is requested for, a month the accommodation is requested for, and whether the day the accommodation was requested for is a holiday.

22. The computer program product of claim 19, further comprising:

for each of the candidate accommodations, calculating a probability of booking acceptance that indicates a likelihood that an acceptance will be received from the host of the accommodation in response to a booking request received from the guest, the probability of booking acceptance for an accommodation in the set being based upon the predicted availability for that accommodation.

23. The computer program product of claim 22, wherein the probability of booking acceptance is calculated based on one or more properties of the guest searching for accommodation.

24. The computer program product of claim 22, wherein the probability of booking acceptance is calculated based on one or more properties of the host associated with the accommodation.