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

SUMMARY

[0004a] ~~According to a first aspect of the present invention, there is provided a computer implemented method, comprising: receiving, by the computer, a search query from a guest for accommodation, the search query comprising a geographical location and a date range; identifying, by the computer, one or more accommodations in the geographical location; for each of the one or more identified accommodations, determining by the computer, a probability of booking, wherein the probability of booking is a measure of a likeliness that the guest will be able to book the accommodation of the date range specified in the search query; ranking the one or more identified accommodations based at least on the probability of booking; and providing the ranked accommodations to the guest.~~

According to a first aspect of the present invention, there is provided a computer implemented method, comprising: receiving, by the computer, a search query from a guest for accommodation, the search query comprising a geographical location and a date range; identifying, by the computer, a set of accommodations in the geographical location, each of the accommodations in the set is associated with an availability calendar that is maintained by a host of the accommodation and indicates that the accommodation is not booked during the date range; for each of the accommodations in the set, calculating, by the computer, a predicted availability of the accommodation using a machine-learning predictive model trained on a plurality of past booking requests and whether those requests were accepted or rejected, the predicted availability for an accommodation in the set indicating a likelihood that the accommodation that is not booked during the date range according to the associated availability calendar is in fact available for booking during the date range; for each of the accommodations in the set, calculating, by the computer, 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; ranking the accommodations in the set based at least on their respective probabilities of booking; and providing the ranked accommodations to the guest.

[0004b] ~~According to a second aspect of the present invention, there is provided an accommodation reservation system, comprising: a computer processor; a search module executed by the processor and configured to: receive a search query from a guest, the search~~

~~query comprising a geographical location and a date range; identify one or more accommodations based on the search query; for each of the one or more identified accommodations, determine a probability of booking, wherein the probability of booking is a measure of a likeliness that the guest will be able to book the accommodation of the date range specified in the search query; and rank the one or more identified accommodations based at least on a probability of booking.~~

According to a second aspect of the present invention, there is provided an accommodation reservation system, comprising: a computer processor; a module executed by the processor and configured to: receive a search query from a guest, the search query comprising a geographical location and a date range; identify a set of accommodations in the geographical location, each of the accommodations in the set is associated with an availability calendar that is maintained by a host of the accommodation and indicates that the accommodation is not booked during the date range; for each of the accommodations in the set, calculate a predicted availability of the accommodation using a machine-learning predictive model trained on a plurality of past booking requests and whether those requests were accepted or rejected, the predicted availability for an accommodation in the set indicating a likelihood that the accommodation that is not booked during the date range according to the associated availability calendar is in fact available for booking during the date range; for each of the accommodations in the set, calculate 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; and rank the accommodations in the set based at least on their respective probabilities of booking.

[0004c] ~~According to a third aspect of the present invention, 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: receive a search query from a guest, the search query comprising a geographical location and a date range; identify one or more accommodations based on the search query; for each of the one or more identified accommodations, determine a probability of booking, wherein the probability of booking is a measure of a likeliness that the guest will be able to book the accommodation of the date range specified in the search query; and rank the one or more identified accommodations based at least on a probability of booking;~~

According to a third aspect of the present invention, 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: receive a search query from a guest, the search query comprising a geographical location and a date range; identify a set of accommodations in the geographical location, each of the accommodations in the set is associated with an availability calendar that is maintained by a host of the accommodation and indicates that the accommodation is not booked during the date range; for each of the accommodations in the set, calculate a predicted availability of the accommodation using a machine-learning predictive model trained on a plurality of past booking requests and whether those requests were accepted or rejected, the predicted availability for an accommodation in the set indicating a likelihood that the accommodation that is not booked during the date range according to the associated availability calendar is in fact available for booking during the date range; for each of the accommodations in the set, calculate 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; and rank the accommodations in the set based at least on their respective probabilities of booking.

[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.

~~What is claimed is:~~

CLAIMS

1. A computer implemented method, comprising:

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

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

for each of the ~~one or more identified~~ accommodations in the set, calculating, by the computer, a predicted availability of the accommodation using a machine-learning predictive model trained on a plurality of past booking requests and whether those requests were accepted or rejected, the predicted availability for an accommodation in the set indicating a likelihood that the accommodation that is not booked during the date range according to the associated availability calendar is in fact available for booking during the date range ~~determining by the computer, a probability of booking, wherein the probability of booking is a measure of a likeliness that the guest will be able to book the accommodation of the date range specified in the search query~~;

for each of the accommodations in the set, calculating, by the computer, 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;

ranking the ~~one or more identified~~ accommodations in the set based at least on ~~the~~ their respective probabilities ~~probability~~ of booking; and

providing the ranked accommodations to the guest.

~~2. The computer implemented method of claim 1, wherein the computer determines the probability of booking using on a predictive model for a probability of availability, wherein the probability of availability is a measure of the likeliness that the accommodation is going to be available for the date range.~~

~~3. The computer implemented method of claim 2, wherein the predictive model for the probability of availability is trained on requests for accommodations made for a number of days in the past.~~

42. The computer implemented method of claim 21, wherein the plurality of past booking requests were ~~predictive model for the probability of availability is trained on requests for accommodations~~ made at most a threshold number of days in the past.

53. The computer implemented method of claim 21, wherein the predicted availability of the accommodation ~~probability of availability determined by the predictive model~~ is based on a day of a week the accommodation is requested for.

64. The computer implemented method of claim 21, wherein the predicted availability of the accommodation ~~probability of availability determined by the predictive model~~ is based on a month the accommodation is requested for.

75. The computer implemented method of claim 21, wherein the predicted availability of the accommodation ~~probability of availability determined by the predictive model~~ is based on whether the day the accommodation was requested for is a holiday.

~~8. The computer implemented method of claim 1, wherein the computer determines the probability of booking using a predictive model for a probability of acceptance, wherein the probability of acceptance is a measure of the likeliness that a host associated with the accommodation is going to accept a request made by the guest, provided that the accommodation is available.~~

96. The computer implemented method of claim 81, wherein the probability of booking acceptance is calculated based on booking requests ~~predictive model for the probability of acceptance is trained on requests~~ made for a number of days in the past.

107. The computer implemented method of claim 81, wherein the probability of booking acceptance is calculated based on booking requests ~~predictive model for the probability of acceptance is trained on requests~~ made for a number of days in the past with a probability of availability greater than a threshold.

118. The computer implemented method of claim 81, wherein the probability of booking acceptance is based on ~~determined by the predictive model is determined by attributes of~~ one or more properties of the guest searching for accommodation.

~~129~~. The computer implemented method of claim ~~81~~, wherein the probability of booking acceptance is based on ~~determined by the predictive model is determined by attributes of~~ one or more properties of the host associated with the accommodation.

~~1310~~. An accommodation reservation system, comprising:

a computer processor;

a ~~search~~ module executed by the processor and configured to:

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

identify ~~one or more~~ a set of accommodations in the geographical location, each of the accommodations in the set is associated with an availability calendar that is maintained by a host of the accommodation and indicates that the accommodation is not booked during the date range ~~based on the search query~~;

for each of the ~~one or more identified~~ accommodations in the set, calculate a predicted availability of the accommodation using a machine-learning predictive model trained on a plurality of past booking requests and whether those requests were accepted or rejected, the predicted availability for an accommodation in the set indicating a likelihood that the accommodation that is not booked during the date range according to the associated availability calendar is in fact available for booking during the date range ~~determine a probability of booking, wherein the probability of booking is a measure of a likeliness that the guest will be able to book the accommodation of the date range specified in the search query~~; ~~and~~

for each of the accommodations in the set, calculate 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; and

rank the ~~one or more identified~~ accommodations in the set based at least on ~~a~~ their respective probabilities ~~probability~~ of booking.

~~14. The accommodation reservation system of claim 13, further comprising:~~

~~an availability module executed by the computer and configured to determine a probability of availability using a predictive model, wherein the probability of availability is a measure of a likeliness that the accommodation is going to be available for the fate range.~~

~~15. The accommodation reservation system of claim 14, wherein the predictive model for the probability of availability is trained on requests for accommodations made at most a threshold number of days in the past.~~

~~16~~11. The accommodation reservation system of claim ~~14~~10, wherein the predicted availability of the accommodation ~~probability of 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.

~~17. The accommodation reservation system of claim 13 further comprising:~~

~~an acceptance module executed by computer and configured to determine a probability of acceptance using a predictive model, wherein the probability of acceptance is a measure of a likeliness that a host associated with the accommodation is going to accept a request made by the guest, provided that the accommodation is available.~~

~~18~~12. The accommodation reservation system of claim ~~17~~10, wherein the probability of booking acceptance is calculated based on booking requests ~~predictive model for the probability of acceptance is trained on requests~~ made for a number of days in the past.

~~19~~13. The accommodation reservation system of claim ~~17~~10, wherein the probability of booking acceptance is calculated based on booking requests ~~predictive model for the probability of acceptance is trained on requests~~ made for a number of days in the past with a probability of availability greater than a threshold.

~~20~~14. The accommodation reservation system of claim ~~17~~10, wherein the probability of booking acceptance is based on ~~acceptance determined by the predictive model is determined by attributes of~~ one or more properties of the guest searching for accommodation.

~~21~~15. The accommodation reservation system of claim ~~17~~10, wherein the probability of booking acceptance is based on ~~acceptance determined by the predictive model is determined by attributes of~~ one or more properties of the host associated with the accommodation.

~~22~~16. 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:

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

identify ~~one or more~~ a set of accommodations in the geographical location, each of the accommodations in the set is associated with an availability calendar that is maintained by a host of the accommodation and indicates that the accommodation is not booked during the date range ~~based on the search query~~;

for each of the ~~one or more identified~~ accommodations in the set, calculate a predicted availability of the accommodation using a machine-learning predictive model trained on a plurality of past booking requests and whether those requests were accepted or rejected, the predicted availability for an accommodation in the set indicating a likelihood that the accommodation that is not booked during the date range according to the associated availability calendar is in fact available for booking during the date range ~~determine a probability of booking, wherein the probability of booking is a measure of a likeliness that the guest will be able to book the accommodation of the date range specified in the search query~~; ~~and~~

for each of the accommodations in the set, calculate 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; and

rank the ~~one or more identified~~ accommodations in the set based at least on a their respective probabilities ~~probability~~ of booking.

~~23. The computer program product of claim 22 further comprising computer program code that causes the processor to~~

~~determine a probability of availability using a predictive model, wherein the probability of availability is a measure of a likeliness that the accommodation is going to be available for the fate range.~~

~~24~~17. The computer program product of claim ~~23~~16, wherein the plurality of past booking requests were ~~predictive model for the probability of availability is trained on requests for accommodations~~ made at most a threshold number of days in the past.

~~25~~18. The computer program product of claim ~~23~~16, wherein the probability of booking acceptance is calculated ~~predictive model for the probability of acceptance is trained on requests 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.

~~26. The computer program product of claim 22 further comprising computer program code that causes the processor to~~

~~determine a probability of acceptance using a predictive model, wherein the probability of acceptance is a measure of a likeliness that a host associated with the accommodation is going to accept a request made by the guest, provided that the accommodation is available.~~

~~27. The computer program product of claim 26, wherein the predictive model for the probability of acceptance is trained on requests made for a number of days in the past.~~

~~28. The computer program product of claim 26, wherein the predictive model for the probability of acceptance is trained on requests made for a number of days in the past with a probability of availability greater than a threshold.~~

~~29~~19. The computer program product of claim ~~26~~18, wherein the probability of booking acceptance is calculated based on ~~probability of acceptance determined by the predictive model is determined by attributes of~~ one or more properties of the guest searching for accommodation.

~~30~~20. The computer program product of claim ~~26~~18, wherein the probability of booking acceptance is calculated based on ~~probability of acceptance determined by the predictive model is determined by attributes of~~ one or more properties of the host associated with the accommodation.