[Summary]

[0006]

Analytics are often used to provide more insight to assist operators for better resource utilization and planning. There is lot of research and implementations that focus on in-cabin crowd density detection such as heat sensing, video analytics such as crowd estimation, counting or flow analysis, ticketing information and even Wi-Fi signals detection. As far as these ideas sound promising but they are still not mature and way too expensive for implementation as it requires a lot of system setup and calibration during deployment as well as hardware maintenance.

[0007]

Moreover, they fail to address the need to estimate available capacity in a non-reserved transportation passenger vehicle since it is not possible to passengers to buy a ticket to reserve a seat in advance in that passenger vehicle.

[0008]

A need therefore exists to provide methods for adaptively estimating capacity of a predetermined area of a vehicle that addresses one or more of the above problems.

[0009]

Furthermore, other desirable features and characteristics will become apparent from the subsequent detailed description and the appended claims, taken in conjunction with the accompanying drawings and this background of the disclosure.

[0010]

In a first aspect, there is provided a method, by a server, for adaptively estimating capacity of a predetermined area of a vehicle, comprising: receiving, by the server, information relating to at least one individual who is positioned at an entrance to enter the predetermined area of the vehicle;

determining, by the server, if the at least one individual fails to enter the predetermined area of the vehicle at a location in response to receiving the information; and

estimating, by the server, the capacity of the predetermined area of the

server, the at least one other server being configured to estimate capacity of the predetermined area of the vehicle at the successive location that is located after the location.

[0016]

In an embodiment, the method further comprises determining, by the at least one other server, a number of individuals who are positioned at an entrance to enter the predetermined area of the vehicle at the successive location.

[0017]

In an embodiment, the method further comprises displaying, by the at least one other server, the result of the estimation step at the vehicle at the other successive location.

[0018]

In an embodiment, the step of displaying the result of the estimation step comprises:

determining if the result of the estimation step is above a predetermined value; and

displaying the result of the estimation step in a predetermined format when it is determined that the result of the estimation step is above the predetermined value.

[0018a]

In a second aspect, there is provided an apparatus for adaptively estimating capacity of a predetermined area of a vehicle, the apparatus comprising:

means for receiving information relating to at least one individual who is positioned at an entrance to enter the predetermined area of the vehicle; means for determining if the at least one individual fails to enter the predetermined area of the vehicle at a location in response to receiving the information; and

means for estimating the capacity of the predetermined area of the vehicle when it is determined that the at least one individual fails to enter the predetermined are of the vehicle.

[0019]

In an embodiment, there is provided an apparatus for adaptively estimating capacity of a predetermined area of a vehicle, the apparatus comprising:

at least one processor; and

at least one memory including computer program code;

the at least one memory and the computer program code configured to, with at least one processor, cause the apparatus at least to:

receive information relating to at least one individual who is positioned at an entrance to enter the predetermined area of the vehicle;

determine if the at least one individual fails to enter the predetermined area of the vehicle at a location in response to receiving the information; and

estimate the capacity of the predetermined area of the vehicle when it is determined that the at least one individual fails to enter the predetermined area of the vehicle.

[0020]

successive location that is located after the location.

[0025]

In an embodiment, the at least one memory and the computer program code is further configured with the at least one processor to:

determine a number of individuals who are positioned at an entrance to enter the predetermined area of the vehicle at the at least one other successive location.

[0026]

In an embodiment, the at least one memory and the computer program code is further configured with the at least one processor to:

displaying the result of the estimation.

[0027]

In an embodiment, the at least one memory and the computer program code is further configured with the at least one processor to:

send the result of the estimation to the at least one other server.

[0028]

In an embodiment, the at least one memory and the computer program code is further configured with the at least one processor to:

determine if the result of the estimation is above a predetermined value; and

display the result of the estimation in a predetermined format when it is determined that the result of the estimation is above the predetermined value.

[0029]

According to the embodiment, it is possible to provide methods for adaptively estimating capacity of a predetermined area of a vehicle that addresses one or more of the above problems.

[Brief Description of Drawings]

[0030]

Embodiments of the invention will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

[Fig. 1]

Fig. 1 shows a block diagrams of a system 100 within which capacity of

[CLAIMS]

1. A method, by a server, for adaptively estimating capacity of a predetermined area of a vehicle, comprising:

receiving, by the server, information relating to at least one individual who is positioned at an entrance to enter the predetermined area of the vehicle;

determining, by the server, if the at least one individual fails to enter the predetermined area of the vehicle at a location in response to receiving the information; and

estimating, by the server, the capacity of the predetermined area of the vehicle when it is determined that the at least one individual fails to enter the predetermined area of the vehicle.

2. The method according to claim 1, wherein the step of estimating the capacity of the predetermined area of the vehicle comprises:

retrieving, by the server, historical data relevant to the vehicle at a successive location that is located after the location, the historical data indicating a number of passengers leaving the predetermined area of the vehicle at the successive location; and

predicting, by the server, a number of individuals leaving the predetermined area of the vehicle at the successive location in response to the historical data.

3. The method according to claim 2, wherein the capacity of the predetermined area of the vehicle at the successive location is estimated in response to the prediction of the number of individuals leaving the predetermined area of the vehicle at the successive location.

4. The method according to any one of the preceding claims, wherein the step of determining if the at least one individual fails to enter the predetermined area of the vehicle at the location, comprises:

receiving, by the server, information indicating that the entrance to enter the predetermined area of the vehicle is closing,

wherein the determination if the at least one individual fails to enter the

predetermined area of the vehicle is performed in response to the receipt of the information indicating that the entrance to enter the predetermined area of the vehicle is closing.

5. The method according to any one of the preceding claims, wherein the step of determining if the at least one individual fails to enter the predetermined area of the vehicle at the location, comprises:

determining, by the server, if a number of individuals who fail to enter the predetermined area of the vehicle is above a threshold value when it is determined that the at least one individual fails to enter the predetermined area of the vehicle.

6. The method according to any one claims 2-3, further comprising sending the result of the estimation step to at least one other server that is operationally coupled to the server, the at least one other server being configured to estimate capacity of the predetermined area of the vehicle at the successive location that is located after the location.

7. The method according to claim 6, further comprising:

determining, by the at least one other server, a number of individuals who are positioned at an entrance to enter the predetermined area of the vehicle at the successive location.

8. The method according to any one of claims 2, 3 or 6, further comprising:

displaying, by the server, the result of the estimation step.

9. The method according to claim 8, further comprising:

displaying, by the at least one other server, the result of the estimation step at the vehicle at the other successive location.

10. An apparatus for adaptively estimating capacity of a predetermined area of a vehicle, the apparatus comprising:

means for receiving information relating to at least one individual who is positioned at an entrance to enter the predetermined area of the vehicle;

means for determining if the at least one individual fails to enter the

predetermined area of the vehicle at a location in response to receiving the information; and

means for estimating the capacity of the predetermined area of the vehicle when it is determined that the at least one individual fails to enter the predetermined area of the vehicle.