CLAIMS

1. A method of identifying a passenger of a vehicle, the method comprising:

receiving, by one or more processors, from a dispatching server, instructions to pick up an assigned passenger associated with a first client computing device, the instructions identifying a first destination location;

after a given passenger enters the vehicle, maneuvering, by the one or more processors, the vehicle towards the first destination location in an autonomous driving mode;

while maneuvering the vehicle towards the first destination location:

receiving, by the one or more processors over time, location information generated by the first client computing device;

receiving, by the one or more processors, a plurality of vehicle motion values generated by a plurality of measurement devices arranged around the vehicle;

determining, by the one or more processors, a confidence level based on a result obtained by comparing changes in one or more of the vehicle motion values over time to changes the received location information over time; and

determining whether the given passenger is the assigned passenger when the confidence level meets a threshold.

2. The method of claim 1, further comprising:

determining that the given passenger is not to the assigned passenger when the confidence level does not meet the threshold:

sending, by the one or more processors, a notification to the dispatching server indicating that the given passenger is determined not to be the assigned passenger;

receiving, by the one or more processors, a second destination location; and

maneuvering, by the one or more processors, the vehicle in the autonomous driving mode towards the second destination location instead of the first destination location.

3. The method of claim 2, wherein the notification requests authentication information for another passenger.

4. The method of claim 2, further comprising, before maneuvering the vehicle towards the second destination:

in response to sending the notification, receiving second authentication information for authenticating a second client computing device; and

using the second authentication information to authenticate the second client computing device associated with another passenger.

5. The method of claim 2, further comprising, before maneuvering the vehicle towards the first destination location, displaying a request for a passenger within the vehicle to confirm the first destination location.

6. The method of claim 2, further comprising:

while maneuvering the vehicle towards the first destination location, using one or more transceivers of the vehicle to communicate with a second client computing device in the vehicle; and

receiving, via the one or more transceivers, a response from the second client computing device, wherein sending the notification is further based on the response received from the second client computing device.

7. The method of claim 1, further comprising:

estimating a speed of the first client computing device based on the received location information; and

comparing a speed of the vehicle with the estimated speed, wherein a determination as to whether the given passenger is the assigned passenger is based on the comparison of the speed of the vehicle with the estimated speed.

8. The method of claim 1, further comprising:

estimating a heading of the first client computing device based on the received location information; and

comparing a heading of the vehicle with the estimated heading,

wherein a determination as to whether the given passenger is the assigned passenger is based on the comparison of the heading of the vehicle with the estimated heading.

9. The method of claim 1, further comprising:

receiving, by the one or more processors from the dispatching server, authentication information for authenticating the first client computing device associated with the assigned passenger; and

prior to the given passenger entering the vehicle, authenticating, by the one or more processors, the first client computing device using the authentication information.

10. The method of claim 1, wherein the received location information includes values determined from global positioning system (GPS) coordinates of the first client computing device.

11. The method of claim 1, wherein the vehicle motion values include at least one of a speed measurement, a heading measurement or an acceleration measurement.

12. A system for identifying a passenger of a driverless vehicle, the system comprising one or more processors configured to:

receive from a dispatching server, instructions to pick up an assigned passenger associated with a first client computing device, the instructions identifying a first destination location;

after a given passenger enters the vehicle, maneuver the vehicle towards the first destination location in an autonomous driving mode;

while maneuvering the vehicle towards the first destination location:

receive, over time, location information generated by the first client computing device;

receive a plurality of vehicle motion values generated by a plurality of measurement devices arranged around the vehicle;

determine a confidence level based on a result obtained by comparing changes in one or more of the vehicle motion values over time to changes in the received location information over time; and

determine that the given passenger is the assigned passenger when the confidence level meets a threshold.

13. The system of claim 12, wherein the one or more processors are further configured to:

determine that the given passenger is not to the assigned passenger when the confidence level does not meet the threshold:

send a notification to the dispatching server indicating that the given passenger is determined not to be the assigned passenger;

receive a second destination location; and

maneuver the vehicle in the autonomous driving mode towards the second destination location instead of the first destination location.

14. The system of claim 13, wherein the notification requests authentication information for another passenger.

15. The system of claim 13, wherein the one or more processors are further configured to, before maneuvering the vehicle towards the second destination location:

in response to sending the notification, receive second authentication information for authenticating a second client computing device; and

use the second authentication information to authenticate the second client computing device associated with another passenger.

16. The system of claim 13, wherein the one or more processors are further configured to:

while maneuvering the vehicle towards the first destination location, use one or more transceivers of the vehicle to communicate with a second client computing device in the vehicle; and

receive via the one or more transceivers, a response from the second client computing device, wherein sending the notification is further based on the response received from the second client computing device.

17. The system of claim 12, wherein the one or more processors are further configured to:

estimate a speed of the first client computing device based on the received location information; and

compare a speed of the vehicle with the estimated speed, wherein a determination as to whether the given passenger is the assigned passenger is based on the comparison of the speed of the vehicle with the estimated speed.

18. The system of claim 12, wherein the one or more processors are further configured to:

estimate a heading of the first client computing device based on the received location information; and

compare a heading of the vehicle with the estimated heading, wherein a determination as to whether the given passenger is the assigned passenger is based on the comparison of the heading of the vehicle with the estimated heading.

19. The system of claim 12, wherein the one or more processors are further configured to:

receive, from the dispatching server, authentication information for authenticating the first client computing device associated with the assigned passenger; and

prior to the given passenger entering the vehicle, authenticate the first client computing device using the authentication information.

20. The system of claim 12, further comprising the vehicle.