

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;
 - receiving, by the one or more processors over time, location information generated by the first client computing device;
 - 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, comparing, by the one or more processors, a location of the vehicle to the received location information; and
 - determining whether the given passenger is the assigned passenger based on the comparison.
2. The method of claim 1, further comprising, when the given passenger is determined not to be the assigned passenger:
 - 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 the second 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 the second 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 transceiver, a response from the second client computing device, and 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 comparing changes in the received location information over time with changes in the location of the vehicle over time and wherein determining whether the given passenger is the assigned passenger is further based on the comparison of changes in the received location information over time with changes in the location of the vehicle over time.

8. 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, and wherein determining whether the first passenger is the assigned passenger is further based on the comparison of the speed of the vehicle with the estimated speed.

9. 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 determining whether the first passenger is the assigned passenger is further based on the comparison of the heading of the vehicle with the estimated heading.

10. 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 first passenger; and

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

11. A system for changing a destination 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;

receive, over time, location information generated by the first client computing device;
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, compare a location of the vehicle to the received location information; and
determine whether the given passenger is the assigned passenger based on the comparison.

12. The system of claim 11, wherein the one or more processors are further configured to when the given passenger is determined not to be the assigned passenger:

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.

13. The system of claim 12, wherein the notification requests authentication information for the second passenger.

14. The system of claim 12, wherein the one or more processors are further configured to, before maneuvering the vehicle towards the second destination:

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 the second passenger.

15. The system of claim 12, 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 transceiver, a response from the second client computing device, and wherein sending the notification is further based on the response received from the second client computing device.

16. The system of claim 11, wherein the one or more processors are further configured to compare changes in the received location information over time with changes in the location of the vehicle over time and to determine whether the given passenger is the assigned passenger is further

based on the comparison of changes in the received location information over time with changes in the location of the vehicle over time.

17. The system of claim 11, 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, and wherein determining whether the first passenger is the assigned passenger is further based on the comparison of the speed of the vehicle with the estimated speed.

18. The system of claim 11, 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 determining whether the first passenger is the assigned passenger is further based on the comparison of the heading of the vehicle with the estimated heading.

19. The system of claim 11, 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 first passenger; and

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

20. The system of claim 11, further comprising the vehicle.