

CLAIMS

1. A vehicle comprising:

a light detection and ranging device (LIDAR) that scans a field-of-view (FOV) along a viewing direction of the LIDAR; and

a controller that:

retrieves data indicative of a map of an environment of the vehicle, wherein the map of the environment is based on at least sensor data from one or more sensors other than the LIDAR,

identifies a portion of the map for scanning by the LIDAR, and

causes an adjustment of the viewing direction of the LIDAR, wherein the LIDAR scans a particular FOV in response to the adjustment of the viewing direction, and wherein the particular FOV is associated with the identified portion of the map.

2. The vehicle of claim 1, wherein the LIDAR is a first LIDAR, the vehicle further comprising:

a second LIDAR that scans the environment of the vehicle based on at least one complete rotation of the second LIDAR about an axis, wherein the one or more sensors include the second LIDAR.

3. The vehicle of claim 2, wherein the controller determines the map of the environment based on at least the scan of the environment by the second LIDAR.

4. The vehicle of claim 2, wherein the first LIDAR and the second LIDAR have different scanning resolutions.

5. The vehicle of claim 1, wherein the controller updates the identified portion of the map based on the scan of the particular FOV by the LIDAR.

6. The vehicle of claim 1, further comprising data storage storing the data indicative of the map of the environment, wherein the controller retrieves the data indicative of the map from the data storage.

7. The vehicle of claim 1, further comprising a wireless communication system, wherein the controller retrieves the data indicative of the map from an external computing device via the wireless communication system.

8. The vehicle of claim 1, wherein the map of the environment comprises a three-dimensional (3D) representation of the environment.

9. The vehicle of claim 8, wherein the controller identifies the portion of the map based on at least the 3D representation indicating presence of an object in a region of the

environment related to the identified portion of the map.

10. The vehicle of claim 9, wherein the controller identifies the portion of the map further based on the object being at greater than a threshold distance to the vehicle.

11. The vehicle of claim 9, wherein the controller determines a given 3D representation of the object based on the scan of the particular FOV by the LIDAR.

12. The vehicle of claim 1, further comprising one or more wheels, wherein the controller operates the one or more wheels based on at least the scan of the particular FOV by the LIDAR.

13. A vehicle comprising:

a sensor that scans a field-of-view (FOV) along a viewing direction of the sensor; and

a controller that:

accesses a three-dimensional (3D) map of an environment of the vehicle, wherein the 3D map is based on data from one or more sensors that scan the environment, and wherein the one or more sensors include at least one sensor other than the sensor that scans the FOV,

identifies a portion of the 3D map for scanning by the sensor, and

causes an adjustment of the viewing direction of the sensor, wherein the sensor

scans a particular FOV associated with the identified portion of the 3D map based on the adjustment.

14. The vehicle of claim 13, wherein the sensor that scans the particular FOV comprises a light detection and ranging device (LIDAR).

15. The vehicle of claim 13, wherein the one or more sensors associated with the 3D map include a light detection and ranging device (LIDAR).

16. The vehicle of claim 13, wherein the one or more sensors associated with the 3D map include the sensor that scans the particular FOV.

17. The vehicle of claim 13, wherein the one or more sensors associated with the 3D map exclude the sensor that scans the particular FOV.

18. A system comprising:

- a first light detection and ranging device (LIDAR) that scans an environment of a vehicle based on rotation of the first LIDAR about an axis;
- a second LIDAR that scans a field-of-view (FOV) along a viewing direction of the second LIDAR;

one or more processors; and

data storage storing instructions that, when executed by the one or more processors, cause the system to perform operations comprising:

determining a three-dimensional (3D) representation of the environment based on at least data from the first LIDAR,

identifying a portion of the 3D representation for scanning by the second LIDAR, and

adjusting the viewing direction of the second LIDAR to correspond to a particular FOV, wherein the particular FOV is associated with the identified portion of the 3D representation.

19. The system of claim 18, wherein the second LIDAR scans the particular FOV in response to the adjustment of the viewing direction, and wherein the operations further comprise updating the identified portion of the 3D representation based on the scan of the particular FOV by the second LIDAR.

20. The system of claim 18, wherein the particular FOV at least partially overlaps a region of the environment associated with the identified portion of the 3D representation.