**CLAIMS**

1. A vehicle comprising:

a first light detection and ranging device (LIDAR) that scans, according to a first scanning resolution, an environment around the vehicle based on rotation of the first LIDAR about an axis;

a second LIDAR that scans, according to a second scanning resolution different than the first scanning resolution, a field-of-view (FOV) of the environment extending away from the vehicle along a viewing direction of the second LIDAR; and

a controller that tracks an object in the environment using:

the first LIDAR, in response to the object being within a first threshold distance to the vehicle, wherein the first threshold distance is based on the first scanning resolution, and

the second LIDAR, in response to the object being at greater than the first threshold distance to the vehicle;

wherein the controller using the first LIDAR to track the object is further in response to the object being at greater than a second threshold distance to the vehicle, and wherein the second threshold distance is based on a mounting position of the first LIDAR on the vehicle.

2. The vehicle of claim 1, wherein the mounting position of the first LIDAR is at a top side of the vehicle.

3. The vehicle of claim 2, wherein the second LIDAR is also positioned at the top side of the vehicle adjacent to the first LIDAR.

4. The vehicle of claim 2, further comprising:

a third LIDAR that scans a given FOV of the environment extending away from a given side of the vehicle different than the top side, wherein the controller tracks the object using the third LIDAR in response to the object being within the second threshold distance to the vehicle.

5. The vehicle of claim 4, further comprising a rear-view mirror, wherein the third LIDAR is mounted to the rear-view mirror.

6. The vehicle of claim 4, wherein the third LIDAR scans the given FOV according to a third scanning resolution different than the first scanning resolution and the second scanning resolution.

7. The vehicle of claim 6, wherein the controller detects the object using the first LIDAR, and wherein the controller identifies the object detected by the first LIDAR using the third LIDAR based on at least the third LIDAR having the third scanning resolution.

8. The vehicle of claim 7, wherein the controller determines that a given distance between the object and the vehicle is less than the second threshold distance based on data from the first LIDAR, and wherein the controller responsively uses the third LIDAR to identify the object.

9. The vehicle of claim 1, wherein the controller detects the object using the first LIDAR, and wherein the controller identifies the object using the second LIDAR based on at least the second scanning resolution of the second LIDAR.

10. The vehicle of claim 9, wherein the controller, in response to detecting the object using the first LIDAR, adjusts the viewing direction of the second LIDAR toward a position of the detected object in the environment.

11. The vehicle of claim 1, wherein the controller determines, based on first data from the first LIDAR, a three-dimensional (3D) representation of the environment having the first scanning resolution, and wherein the controller modifies a portion of the 3D representation to have the second scanning resolution of the second LIDAR based on second data from the second LIDAR.

12. The vehicle of claim 11, wherein the controller identifies a portion of the 3D representation indicative of the object, wherein the controller adjusts the viewing direction of the second LIDAR to a particular FOV that corresponds to the identified portion of the 3D

representation, and wherein the controller obtains the second data based on the adjustment of the viewing direction.

13. A vehicle comprising:

a plurality of light detection and ranging devices (LIDARs) including a first LIDAR and a second LIDAR,

wherein the first LIDAR scans, according to a first scanning resolution, an environment around the vehicle based on rotation of the first LIDAR about an axis, and

wherein the second LIDAR scans, according to a second scanning resolution different than the first scanning resolution, a field-of-view (FOV) of the environment extending away from the vehicle along a viewing direction of the second LIDAR; and

a controller that selects and uses the first LIDAR for tracking an object in the environment based on at least a comparison of a first threshold distance to an object distance between the object and the vehicle, wherein the first threshold distance is based on the first scanning resolution;

wherein the controller that uses the first LIDAR to track the object is further in response to the object being at greater than a second threshold distance to the vehicle, and wherein the second threshold distance is based on a mounting position of the first LIDAR on the vehicle.

14. The vehicle of claim 13, wherein the first LIDAR is mounted to a first side of the vehicle, wherein the second LIDAR is also mounted to the first side of the vehicle,

wherein the plurality of LIDARs also includes a third LIDAR mounted to a second side of the vehicle, and wherein the third LIDAR scans a FOV of the environment extending away from the second side.

15. The vehicle of claim 14, wherein the controller selects the third LIDAR for tracking the object based on at least the object distance being less than the second threshold distance, and wherein the second threshold distance is based on a position of the first LIDAR at the first side of the vehicle.

16. A method comprising:

scanning, via a first light detection and ranging device (LIDAR) that rotates about an axis, according to a first scanning resolution of the first LIDAR, an environment around a vehicle;

scanning, via a second LIDAR, according to a second scanning resolution of the second LIDAR different than the first scanning resolution, a field-of-view (FOV) of the environment that extends away from the vehicle along a viewing direction of the second LIDAR;

tracking an object in the environment using the first LIDAR in response to the object being within a first threshold distance to the vehicle, wherein the first threshold distance is based on the first scanning resolution; and

tracking the object using the second LIDAR in response to the object being at greater than the first threshold distance to the vehicle;

wherein tracking the object using the first LIDAR is further in response to the object being at greater than a second threshold distance to the vehicle, and wherein the second threshold distance is based on a mounting position of the first LIDAR on the vehicle.

17. The method of claim 16, further comprising:

determining a three-dimensional (3D) representation of the environment having the first scanning resolution based on first data from the first LIDAR;

detecting the object based on the 3D representation;

adjusting, based on the 3D representation, the viewing direction of the second LIDAR toward the object; and

determining a given 3D representation of the object having the second scanning resolution based on second data from the second LIDAR.

18. The method of claim 16, further comprising:

detecting, via the second LIDAR, the object at greater than the first threshold distance to the vehicle based on at least the second scanning resolution of the second LIDAR.