

Claims

1. A device comprising:
 - a light detection and ranging (LIDAR) device, wherein the LIDAR device is configured to obtain data within a first region, and wherein the LIDAR device comprises:
 - a light source configured to emit light; and
 - a plurality of detectors;
 - a further LIDAR device, wherein the further LIDAR device is configured to obtain data within a second region, and wherein the first and second regions do not fully overlap horizontally; and
 - a controller configured to:
 - receive target or directional information based on an initial three-dimensional (3D) representation of an environment of the device;
 - in response to receiving the target or directional information, cause an adjustment to a pointing direction of the LIDAR device;
 - cause the LIDAR device to scan a field-of-view (FOV) of the environment; and
 - provide information indicative of a 3D representation of the environment based on data from scanning the FOV.
2. The device of claim 1, wherein the light source comprises a laser.
3. The device of claim 1, further comprising:
 - a housing, wherein at least the scanning portion is disposed within the housing, and wherein a wall of the housing comprises a light filter configured to allow the emitted light to propagate through the light filter; and

a rotational mount configured to rotate at least a portion of the LIDAR device about a second axis.

4. The device of claim 3 wherein the housing is positioned at a top side of a vehicle, wherein the second axis comprises an axis passing through the top side of the vehicle, and wherein the rotational mount is configured to rotate within a 360 degree range of motion about the second axis.

5. The device of claim 3 wherein the light filter has a dome shape and wherein the light filter is configured to attenuate visible light propagating into the housing.

6. A system comprising:

a vehicle;

a sensing device configured to provide environmental data indicative of an environment around the vehicle, wherein the sensing device is coupled to the vehicle;

a light detection and ranging (LIDAR) device, wherein the LIDAR device is configured to obtain data within a first region, and wherein the LIDAR device is coupled to the vehicle;

a further LIDAR device, wherein the further LIDAR device is configured to obtain data within a second region, and wherein the first and second regions do not fully overlap horizontally; and

a controller configured to:

receive the environmental data from the sensing device, wherein the environmental data comprises target or directional information based on an initial three-dimensional (3D) representation of an environment of the vehicle;

cause an adjustment to a pointing direction of the LIDAR device based at least on the target or directional information;

cause the LIDAR device to scan a field-of-view (FOV) of the environment; and

providing information indicative of a 3D representation of the environment based on data from scanning the FOV.

7. The system of claim 6 wherein the LIDAR device comprises a light source, wherein the light source comprises a laser.

8. The system of claim 7, wherein the laser is configured to emit light having a wavelength of 1550 nm.

9. The system of claim 6 wherein the LIDAR device further comprises a scanning portion.

10. The system of claim 9 wherein at least the scanning portion of the LIDAR device is disposed within a housing, wherein the housing is positioned at a top side of the vehicle, wherein a second axis comprises an axis passing through the top side of the vehicle, and wherein a rotational mount is configured to rotate at least a portion of the LIDAR device within a 360 degree range of motion about the second axis.

11. The system of claim 10 wherein the housing comprises a light filter, wherein the light filter has a dome shape, and wherein the light filter is configured to attenuate visible light propagating into the housing.

12. The system of claim 6, wherein the target or directional information is further indicative of at least one of: a type of object, a size of an object, a shape of an object, a position, a location, or an angle range.

13. A method comprising:

receiving target or directional information by a controller of a light detection and ranging (LIDAR) device configured to obtain data within a first region, wherein the target or directional information is based on an initial three dimensional (3D) representation of an environment of the LIDAR device and is indicative at least one of: a type of object, a size of an object, a shape of an object, a distance, a position, or an angle range;

in response to receiving the target or directional information, causing the LIDAR device to adjust a pointing direction of the LIDAR device;

causing a light source of the LIDAR device to emit light, wherein the light source comprises a laser;

causing the LIDAR device to scan a field-of-view (FOV) of the environment, wherein the FOV extends away from the LIDAR device along the pointing direction;

determining a 3D representation of the environment based on data from scanning the FOV;
and

causing a further LIDAR device configured to obtain data within a second region, wherein the first and second regions do not fully overlap horizontally, to scan a FOV of the environment corresponding to a second region; and

determining a 3D representation of the environment corresponding to the second region.

14. The method of claim 13, wherein the LIDAR device is coupled to a rotational mount, and wherein adjusting the pointing direction of the LIDAR device comprises causing the rotational mount to rotate at least a portion of the LIDAR device about a rotational axis.

15. The method of claim 13 further comprising identifying at least one object in the environment based on the 3D representation.

16. The system of claim 6, wherein the sensing device comprises at least one of a RADAR device, a sonar transducer, and a second LIDAR device.

17. The device of claim 1 wherein the LIDAR device and the further LIDAR device are independently movable.

18. The method of claim 13, wherein causing the further LIDAR to scan a FOV of the environment comprises causing the further LIDAR to move independently of the LIDAR device.

19. The device of claim 1 wherein the first region extends further from the device than the second region.

20. The device of claim 1 wherein the first region is horizontally entirely within the second region.