CLAIMS

1. A system comprising:

a light detection and ranging (LIDAR) device that scans a field-of-view defined by a pointing direction of the LIDAR device, wherein the LIDAR device is mounted to a vehicle;

an actuator that adjusts the pointing direction of the LIDAR device;

a communication interface that receives timing information from an external system; and

a controller that (i) determines a target pointing direction based on the received timing information and (ii) causes the actuator to adjust the pointing direction of the LIDAR device based on at least the target pointing direction, wherein the timing information from the external system is also used to adjust one or more pointing directions of one or more other LIDAR devices mounted to one or more other vehicles such that the pointing direction of the LIDAR device and the one or more pointing directions of the one or more other LIDAR devices are aligned.

2. The system of claim 1, further comprising:

one or more sensors that provide an indication of an orientation of the vehicle relative to an environment of the vehicle, wherein the controller causes the actuator to adjust the pointing direction of the LIDAR device further based on data from the one or more sensors.

3. The system of claim 2, wherein the one or more sensors comprise a yaw sensor

that indicates a measurement of a yaw direction of the vehicle in the environment.

4. The system of claim 2, wherein the one or more sensors comprise a yaw rate sensor that indicates a measurement of a yaw rate of change to a yaw direction of the vehicle in the environment.

5. The system of claim 1, further comprising:

one or more devices that provide an indication of an orientation of the LIDAR device relative to the vehicle, wherein the controller causes the actuator to adjust the pointing direction of the LIDAR device further based on data from the one or more devices.

6. The system of claim 5, wherein the one or more devices include a LIDAR direction indicator that indicates a measurement of the pointing direction of the LIDAR device relative to the vehicle.

7. The system of claim 5, wherein the one or more devices include a LIDAR rotation indicator that indicates a measurement of a rate of change to the pointing direction of the LIDAR device relative to the vehicle.

8. The system of claim 1, further comprising a satellite navigation system sensor associated with the communication interface, wherein the timing information relates to a reference clock signal indicated by data from the satellite navigation system sensor.

9. The system of claim 1, wherein the timing information relates to a reference clock signal indicated by data from one or more network servers accessible to the system via the communication interface.

10. The system of claim 1, wherein the timing information relates to a reference clock signal indicated by data from a cellular communication network accessible to the system via the communication interface.

11. A vehicle comprising:

a light detection and ranging (LIDAR) device that scans a field-of-view defined by a pointing direction of the LIDAR device;

an actuator that rotates the LIDAR device about an axis to adjust the pointing direction of the LIDAR device;

a communication interface that receives timing information from an external system; and

a controller that (i) determines a target pointing direction based on the received timing information and (ii) causes the actuator to adjust one or more characteristics of the rotation of the LIDAR device based on at least the target pointing direction, wherein the timing information from the external system is also used to adjust one or more characteristics of rotation of one or more other LIDAR devices mounted to one or more other vehicles such that the LIDAR device and the one or more other LIDAR devices have a common frequency and phase of rotation.

12. The vehicle of claim 11, wherein the one or more characteristics include a direction of the rotation of the LIDAR device about the axis.

13. The vehicle of claim 11, wherein the one or more characteristics include a phase of the rotation of the LIDAR device about the axis.

14. The vehicle of claim 13, further comprising:

a sensor that provides an indication of a yaw direction of the vehicle in an environment of the vehicle, wherein the controller causes the actuator to adjust the phase of the rotation further based on the yaw direction indicated by the yaw sensor.

15. The vehicle of claim 13, further comprising:

a device that indicates a measured position of the LIDAR device about the axis, wherein the controller causes the actuator to adjust the phase of the rotation further based on the measured position.

16. The vehicle of claim 11, wherein the one or more characteristics include a frequency of the rotation of the LIDAR device about the axis.

17. The vehicle of claim 16, further comprising:

a sensor that provides an indication of a yaw rate of change to a yaw direction of the

vehicle in the environment, wherein the controller adjusts the frequency of the rotation of the LIDAR device about the axis further based on the yaw rate.

18. The vehicle of claim 16, further comprising:

a device that indicates a measurement of the frequency of the rotation of the LIDAR device about the axis, wherein the controller adjusts the frequency of the rotation of the LIDAR device further based on the measurement of the frequency.

19. A method comprising:

scanning, via a light detection and ranging (LIDAR) device, a field-of-view defined by a pointing direction of the LIDAR device, wherein the LIDAR device is mounted to a vehicle;

receiving, via a communication interface, timing information from an external system;

determining a target pointing direction based on at least the received timing information; and

adjusting, via an actuator, the pointing direction of the LIDAR device based on at least the target pointing direction, wherein the timing information from the external system is also used to adjust one or more pointing directions of one or more other LIDAR devices mounted to one or more other vehicles such that the pointing direction of the LIDAR device and the one or more pointing directions of the one or more other LIDAR devices are aligned.

20. The method of claim 19, further comprising:

determining a current pointing direction of the LIDAR device based on measurements

indicated by one or more sensors; and

modulating power provided to the actuator based on a difference between the target pointing direction and the current pointing direction.