

What is claimed is:

1. A system for distinguishing solid objects from particles in the air using laser light, said system comprised of:
 - a first lidar device that scans an area by emitting pulses of laser light and detecting laser light that is reflected;
 - a second lidar device that scans the same or substantially the same area as the first lidar device by emitting pulses of laser light and detecting laser light that is reflected;
 - a computer that compares emitted pulses and reflected laser light detected by the first lidar device with emitted pulses and reflected laser light detected by the second lidar device;wherein the presence of a solid object is confirmed when the first lidar device and the second lidar device detect reflected laser light from the solid object.
2. The system of claim 1, wherein the first lidar device and the second lidar device utilize multi-echo technology to distinguish solid objects from particles in the air.
3. The system of claim 1, wherein the first lidar device and the second lidar device scan multiple planes and compare echoes from one or more planes to confirm that one or more echoes is reflected from a solid object rather than particles in the air.
4. The system of claim 1, wherein the first lidar device and the second lidar device are positioned on a horizontal plane at a distance of 0.5 to 2.5 meters from each other.
5. A method of distinguishing solid objects from particles in the air comprised of the steps of:
 - scanning an area near an autonomous vehicle by emitting pulses of laser light and detecting echoes with a first lidar unit;
 - scanning substantially the same area by emitting pulses of laser light and detecting

echoes with a second lidar unit;

using an algorithm to compare pulses emitted and echoes received by the first lidar unit with pulses emitted and echoes received by the second lidar unit; and

confirming the presence of a solid object when the first lidar unit and the second lidar unit detect echoes from the solid object.

6. The method of claim 5, wherein the first lidar unit and the second lidar unit use multi-echo scanning.

7. The method of claim 5, wherein the first lidar unit and the second lidar unit scan multiple planes and compare echoes from one or more planes to distinguish solid objects from airborne particles.

8. The method of claim 7, wherein the presence of a solid object is confirmed when echoes are detected in more than one plane.

9. The method of claim 5, wherein the first lidar unit and the second lidar unit are positioned at a distance of 0.5 to 2.5 meters from each other on a horizontal plane.

10. A method of distinguishing solid objects or obstacles from particles present in the air comprising the steps of:

- a) using a first lidar device to scan an area by emitting pulses of laser light and detecting reflected laser light;
- b) using a second lidar device to scan substantially the same area by emitting pulses of laser light and detecting reflected laser light;
- c) collecting data related to emitted laser light and reflected laser light from the first lidar device;
- d) collecting data related to emitted laser light and reflected laser light from the second lidar device; and
- e) determining that reflected laser light is the result of particles in the air when

one of the first lidar device and the second lidar device detects reflected laser light that is not detected by both the the first lidar device and the second lidar device.

11. The method of claim 10, wherein the first lidar device and the second lidar device use multi-echo scanning.

12. The method of claim 10, wherein the first lidar device and the second lidar device scan multiple planes and compare echoes from one or more planes to distinguish solid objects from particles in the air.

13. The method of claim 12, wherein the presence of a solid object is confirmed when echoes are detected in more than one plane.

14. A method for confirming the presence of a solid object using lidar comprised of the steps of:

- a) using a first lidar device to scan multiple planes, wherein pulses of laser light are emitted and reflected laser light is detected;
- b) collecting data related to laser light emitted from the first lidar device and reflected laser light detected by the first lidar device;
- c) determining whether reflected light from the first lidar device is the result of particles in the air by comparing multiple planes for the presence and/or absence of reflected light;
- d) using a second lidar device to scan multiple planes, wherein pulses of laser light are emitted and reflected laser light is detected;
- e) collecting data related to laser light emitted from the second lidar device and reflected laser light detected by the second lidar device;
- f) determining whether reflected laser light from the second lidar device is the result of particles in the air by comparing multiple planes for the presence and/or absence of reflected laser light; and

g) using an algorithm to compare data from the first lidar device with data from the second lidar device;

wherein the multiple planes scanned by the first lidar device are in the same area or substantially the same area as the multiple planes scanned by the second lidar device; and

wherein the presence of a solid object is confirmed when the first lidar device and the second lidar device detect reflected laser light in multiple planes from the solid object.

15. The method of claim 14, wherein the presence of a solid object is confirmed when reflected laser light is detected in four or more of the multiple planes of the first lidar device and/or four or more of the multiple planes of the second lidar device.

16. The method of claim 14, wherein the first lidar device and the second lidar device use multi-echo scanning.

17. The method of claim 14, wherein the first lidar device and the second lidar device are positioned at a distance of 0.5 to 2.5 meters from each other on a horizontal plane.