WE CLAIM:

1. A system for driving aid, comprising a control unit including:

one or more storage media including a set of instructions for identifying and positioning one or more objects around a vehicle; and

one or more microchips electronically connected to the one or more storage media, wherein during operation of the system, the one or more microchips execute the set of instructions to:

obtain a first Light Detection and Ranging (LiDAR) point cloud image around a detection base station;

identify one or more objects in the first LiDAR point cloud image;

determine one or more locations of the one or more objects in the first LiDAR point cloud image;

generate a 3D shape for each of the one or more objects; and

generate a second LiDAR point cloud image by marking the one or more objects in the first LiDAR point cloud image based on the locations and the 3D shapes of the one or more objects.

2. The system of claim 1, further comprising:

at least one LiDAR device in communication with the control unit to send the first LiDAR point cloud image to the control unit; and

at least one of

at least one camera in communication with the control unit to send a camera image to the control unit, or

at least one radar device in communication with the control unit to send a radar image to the control unit.

3. The system of claim 1, wherein the detection base station is a vehicle; and the system further comprising:

at least one LiDAR device mounted on a steering wheel, a cowl or reflector of the vehicle, wherein the mounting of the at least one LiDAR device includes at least one of an adhesive bonding, a bolt and nut connection, a bayonet fitting, or a vacuum fixation.

4. The system of claim 1, wherein the one or more microchips further:

obtain a first camera image including at least one of the one or more objects;

identify at least one target object of the one or more objects in the first camera image and at least one target location of the at least one target object in the first camera image; and

generate a second camera image by marking the at least one target object in the first camera image based on the at least one target location in the first camera image and the 3D shape of the at least one target object in the second LiDAR point cloud image.

5. The system of claim 4, wherein in marking the at least one target object in the first camera image, the one or more microchips further:

obtain a 2D shape of the at least one target object in the first camera image;

correlate the second LiDAR point cloud image with the first camera image;

generate a 3D shape of the at least one target object in the first camera image based on the 2D shape of the at least one target object and the correlation between the second LiDAR point cloud image and the first camera image;

generate a second camera image by marking the at least one target object in the first camera image based on the identified location in the first camera image and the 3D shape of the at least one target object in the first camera image.

6. The system of claim 4, wherein to identify the at least one target object in the first camera image and the location of the at least one target object in the first camera image, the one or more microchips operate a you only look once (YOLO) network or a Tiny-YOLO network to identify the at least one target object in the first camera image and the location of the at least one target object in the first camera image.

7. The system of claim 1, wherein to identify the one or more objects in the first LiDAR point cloud image, the one or more microchips further:

obtain coordinates of a plurality of points in the first LiDAR point cloud image, wherein the plurality of points includes uninterested points and remaining points;

remove the uninterested points from the plurality of points according to the coordinates;

cluster the remaining points into one or more clusters based on a point cloud clustering algorithm; and

select at least one of the one or more clusters as at least one target cluster, each of the at least one target cluster corresponding to an object.

8. The system of claim 1, wherein to generate a 3D shape for each of the one or more objects, the one or more microchips further:

determine a preliminary 3D shape of the object;

adjust at least one of a height, a width, a length, a yaw, or an orientation of the preliminary 3D shape to generate a 3D shape proposal;

calculate a score of the 3D shape proposal;

determine whether the score of the 3D shape proposal satisfies a preset condition;

In response to the determination that the score of the 3D shape proposal does not satisfy a preset condition, further adjust the 3D shape proposal; and

In response to the determination that the score of the 3D shape proposal or further adjusted 3D shape proposal satisfies the preset condition, determine the 3D shape proposal or further adjusted 3D shape proposal as the 3D shape of the object.

9. The system of claim 8, wherein the score of the 3D shape proposal is calculated based on at least one of a number of points of the first LiDAR point cloud image inside the 3D shape proposal, a number of points of the first LiDAR point cloud image outside the 3D shape proposal, or distances between the points of the first LiDAR point cloud image inside the 3D shape proposal or the points of the first LiDAR point cloud image outside the 3D shape proposal and the 3D shape.

10. The system of claim 1, wherein the one or more microchips further:

obtain a first radio detection and ranging (Radar) image around the detection base station;

identify the one or more objects in the first Radar image;

determine one or more locations of the one or more objects in the first Radar image;

generate a 3D shape for each of the one or more objects in the first Radar image;

generate a second Radar image by marking the one or more objects in the first Radar image based on the locations and the 3D shapes of the one or more objects in the first Radar image; and

fuse the second Radar image and the second LiDAR point cloud image to

generate a compensated image.

11. The system of claim 1, wherein the one or more microchips further:

obtain two first LiDAR point cloud images around the base station at two different time frames;

generate two second LiDAR point cloud images at the two different time frames based on the two first LiDAR point cloud images; and

generate a third LiDAR point cloud image at a third time frame based on the two second LiDAR point cloud images by an interpolation method.

12. The system of claim 1, wherein the one or more microchips further:

obtain a plurality of first LiDAR point cloud images around the base station at a plurality of different time frames;

generate a plurality of second LiDAR point cloud images at the plurality of different time frames based on the plurality of first LiDAR point cloud images; and

generate a video based on the plurality of second LiDAR point cloud images.

13. A method implemented on a computing device having one or more storage media storing instructions for identifying and positioning one or more objects around a vehicle, and one or more microchips electronically connected to the one or more storage media, the method comprising:

obtaining a first light detection and ranging (LiDAR) point cloud image around a detection base station;

identifying one or more objects in the first LiDAR point cloud image;

determining one or more locations of the one or more objects in the first LiDAR point image;

generating a 3D shape for each of the one or more objects; and

generating a second LiDAR point cloud image by marking the one or more objects in the first LiDAR point cloud image based on the locations and the 3D shapes of the one or more objects.

14. The method of claim 13, further comprising:

obtaining a first camera image including at least one of the one or more objects;

identifying at least one target object of the one or more objects in the first camera image and at least one target location of the at least one target object in the first camera image; and

generating a second camera image by marking the at least one target object in the first camera image based on the at least one target location in the first camera image and the 3D shape of the at least one target object in the second LiDAR point cloud image.

15. The method of claim 14, wherein the marking the at least one target object in the first camera image further includes:

obtaining a 2D shape of the at least one target object in the first camera image;

correlating the second LiDAR point cloud image with the first camera image;

generating a 3D shape of the at least one target object in the first camera image based on the 2D shape of the at least one target object and the correlation between the second LiDAR point cloud image and the first camera image;

generating a second camera image by marking the at least one target object in the first camera image based on the identified location in the first camera image and the 3D shape of the at least one target object in the first camera image.

16. The method of claim 14, wherein the identifying the at least one target object in the first camera image and the location of the at least one target object in the first camera image further includes:

operating a you only look once (YOLO) network or a Tiny-YOLO network to identify the at least one target object in the first camera image and the location of the at least one target object in the first camera image.

17. The method of claim 13, wherein the identifying the one or more objects in the first LiDAR point cloud image further includes:

obtaining coordinates of a plurality of points in the first LiDAR point cloud image, wherein the plurality of points includes uninterested points and remaining points;

removing the uninterested points from the plurality of points according to the coordinates;

clustering the remaining points into one or more clusters based on a point cloud clustering algorithm; and

selecting at least one of the one or more clusters as at least one target cluster, each of the at least one target cluster corresponding to an object.

18. The method of claim 13, wherein the generating a 3D shape for each of the one or more objects further includes:

determining a preliminary 3D shape of the object;

adjusting at least one of a height, a width, a length, a yaw, or an orientation of the preliminary 3D shape to generate a 3D shape proposal;

calculating a score of the 3D shape proposal;

determining whether the score of the 3D shape proposal satisfies a preset condition;

In response to the determination that the score of the 3D shape proposal does not satisfy a preset condition, further adjusting the 3D shape proposal; and

In response to the determination that the score of the 3D shape proposal or further adjusted 3D shape proposal satisfies the preset condition, determining the 3D shape proposal or further adjusted 3D shape proposal as the 3D shape of the object.

19. The method of claim 18, wherein the score of the 3D shape proposal is calculated based on at least one of a number of points of the first LiDAR point cloud image inside the 3D shape proposal, a number of points of the first LiDAR point cloud image outside the 3D shape proposal, or distances between the points of the first LiDAR point cloud image inside the 3D shape proposal or the points of the first LiDAR point cloud image outside the 3D shape proposal and the 3D shape.

20. The method of claim 13, further comprising:

obtaining a first radio detection and ranging (Radar) image around the detection base station;

identifying the one or more objects in the first Radar image;

determining one or more locations of the one or more objects in the first Radar image;

generating a 3D shape for each of the one or more objects in the first Radar image;

generating a second Radar image by marking the one or more objects in the first Radar image based on the locations and the 3D shapes of the one or more objects in the first Radar image; and

fusing the second Radar image and the second LiDAR point cloud image to

generate a compensated image.

21. The method of claim 13, further comprising:

obtaining two first LiDAR point cloud images around the base station at two different time frames;

generating two second LiDAR point cloud images at the two different time frames based on the two first LiDAR point cloud images; and

generating a third LiDAR point cloud image at a third time frame based on the two second LiDAR point cloud images by an interpolation method.

22. The method of claim 13, further comprising:

obtaining a plurality of first LiDAR point cloud images around the base station at a plurality of different time frames;

generating a plurality of second LiDAR point cloud images at the plurality of different time frames based on the plurality of first LiDAR point cloud images; and

generating a video based on the plurality of second LiDAR point cloud images.

23. A non-transitory computer readable medium, comprising at least one set of instructions for identifying and positioning one or more objects around a vehicle, wherein when executed by microchips of an electronic terminal, the at least one set of instructions directs the microchips to perform acts of:

obtaining a first light detection and ranging (LiDAR) point cloud image around a detection base station;

identifying one or more objects in the first LiDAR point cloud image;

determining one or more locations of the one or more objects in the first LiDAR point image;

generating a 3D shape for each of the one or more objects; and

generating a second LiDAR point cloud image by marking the one or more objects in the first LiDAR point cloud image based on the locations and the 3D shapes of the one or more objects.