CLAIMS:

1. A method for automatically locating one or more static objects in an environment, the method comprising;

receiving a plurality of 2D images of the environment;

detecting one or more static objects from the plurality of 2D images and generating a data set of 2D static object detections; and

performing a voting-based triangulation on the data set of 2D static object detections to determine 3D positions for the one or more static objects detected in the environment, wherein a vote to determine the 3D positions is based on a distance between an estimated 3D position for one of the one or more static objects and a position of one of the 2D static object detections satisfying a distance threshold.

2. The method of claim 1 wherein the 2D images are provided with at least one of or any combination of: camera-intrinsic parameters; pose information; or six degrees-of-freedom pose information for each image, optionally, the 2D images are captured using a fleet of vehicles.

3. The method of any preceding claim wherein the step of detecting one or more static objects and generating a data set of 2D static object detections comprises at least one of or any combination of:

considering a static object detected when the same static object is detected in at least two 2D images from the plurality of 2D images;

the object is detected in the at least two 2D images with a minimum angle difference;

computing a pixel probability to determine whether a pixel corresponds to a static object;

a thresholding technique to determine neighbouring connecting pixels that also represent the static object; or

the use of bounding boxes to identify static objects in each 2D image.

4. The method of any preceding claim wherein the voting-based triangulation comprises using at least two detections from different 2D images that correspond to the same static object.

5. The method of claim 4 wherein the voting-based triangulation further comprises creating a hypothesis for each of the at least two detections of the static object.

6. The method of claim 5 wherein the or each hypothesis is scored based on a number of votes wherein each vote is indicative of the hypothesis being correct.

7. The method of claim 5 or 6 wherein a 3D position for the or each hypothesis is estimated.

8. The method of any preceding claim wherein the voting comprises:

using the image pose information and camera-intrinsic information, projecting each estimated 3D position of the or each hypothesis into the plurality of 2D images; and

assigning a vote to the or each hypothesis when the distance between the 3D position and any 2D detection is less than a first threshold.

9. The method of any preceding claim wherein the or each hypothesis is confirmed to be correct by the number of received votes, so as to create a set of confirmed hypotheses.

10. The method of claim 7 further comprising a K-view triangulation to determine an accurate 3D position for the or each hypothesis, where K is dependent upon the number of different images that contributed a vote to the hypothesis.

11. The method of any preceding claim wherein the one or more static objects are traffic lights and/or traffic signs.

12. The method of any of claims 5 to 11 wherein the creation of the hypothesis comprises any one of:

determining whether the projected position is less than *dmax* to any 2D detection;

determining whether the 3D position point is triangulated in front of each camera;

determining whether the angle between each projected position is larger than *Bmin*; or

determining whether the distance from the static object to either camera is less than *Tmax*·

13. The method of any preceding claim wherein the method for locating automatically one or more static objects in an environment is performed in clusters of the environment using a distribution schema to split the data set.

14. The method of claim 13 wherein each cluster operates independently.

15. The method of any preceding claim wherein the step of detecting one or more static objects comprises the use of a binary segmentation network and/or convolutional neural networks.

16. The method of claim 15 wherein the binary segmentation network and/or convolutional neural networks are trained using an existing data set.

17. The method of any preceding claim wherein each 2D image is processed using structure-from-motion, SFM, techniques to estimate pose information of each 2D image.

18. The method of any preceding claim where the voting-based triangulation is a voting schema performed to determine 3D positions for the one or more static objects.

19. The method of claim 18 wherein each vote of the voting schema is assigned when a hypothesis based on the 2D static object detections is correct.

20. The method of claim 19 wherein the number of votes per hypothesis determines the accuracy of the hypothesis.

21. The method of any preceding claim wherein the step of performing a voting- based triangulation is fully automated.

22. A system for automatically locating one or more static objects in an environment, the system comprising;

a fleet of vehicles operable to capture a plurality of 2D images of the environment;

a cloud based network comprising a processor operable to determine one or more static objects from the plurality of 2D images and generate a data set of 2D static object detections; wherein

the processor is operable to perform a voting-based triangulation on the data set of the 2D static object detections to determine 3D positions for the one or more static objects detected in the environment, wherein a vote to determine the 3D positions is based on a distance between an estimated 3D position for one of the one or more static objects and a position of one of the 2D static object detections satisfying a distance threshold.

23. A system comprising at least one server system operable to perform the method of any of claims 1 to 21.

24. The system of claims 22 or 23 further comprising a plurality of independent clusters configured to independently process a portion of the environment.

25. A vehicle for automatically locating one or more static objects in an environment, the vehicle comprising;

a camera operable to capture a plurality of 2D images of the environment;

a connection to a cloud based network comprising a processor operable to determine one or more static objects from the plurality of 2D images and generate a data set of 2D static object detections; wherein

the processor is operable to perform a voting-based triangulation on the data set of the 2D static object detections to determine 3D positions for the one or more static objects detected in the environment, wherein a vote to determine the 3D positions is based on a distance between an estimated 3D position for one of the one or more static objects and a position of one of the 2D static object detections satisfying a distance threshold.

26. A method for updating map data when automatically locating one or more static objects in an environment, the method comprising;

receiving a plurality of 2D images of the environment;

determining one or more static objects from the plurality of 2D images and generating a data set of 2D static object detections;

performing a voting-based triangulation on the data set of the 2D static object detections to determine 3D positions for the one or more static objects detected in the environment, wherein a vote to determine the 3D positions is based on a distance between an estimated 3D position for one of the one or more static objects and a position of one of the 2D static object detections satisfying a distance threshold; and

updating existing map data with one or more newly located static objects.

27. A computer program product for providing the method or system of any preceding claim.