

CLAIMS

1. A method for determining a bounding box of a target object, comprising:

obtaining attribute information of each of a plurality of key points of a target object;
and

determining a bounding box position of the target object according to the attribute information of each of the plurality of key points of the target object and to a preset neural network,

wherein the attribute information of the key point comprises coordinate information and a presence determination value.

2. The method according to claim 1, wherein determining the bounding box position of the target object according to the attribute information of each of the plurality of key points of the target object and to the preset neural network comprises:

determining at least one valid key point from the plurality of key points according to the attribute information of each of the plurality of key points;

processing, according to the attribute information of each of the at least one valid key point, the attribute information of the plurality of key points to obtain processed attribute information of the plurality of key points; and

inputting the processed attribute information of the plurality of key points to the preset neural network for processing to obtain the bounding box position of the target object.

3. The method according to claim 2, wherein the processed attribute information of the plurality of key points comprises: processed attribute information of each of the at least one valid key point, and attribute information of key points other than the at least one valid key point in the plurality of key points.

4. The method according to claim 2 or 3, wherein processing, according to the attribute information of each of the at least one valid key point, the attribute information of the plurality of key points to obtain processed attribute information of the plurality of key points comprises:

determining a reference coordinate according to coordinate information comprised in the attribute information of each of the at least one valid key point; and

determining coordinate information in the processed attribute information of each valid key point according to the reference coordinate and to the coordinate information in the attribute information of each of the at least one valid key point.

5. The method according to claim 4, wherein determining the reference coordinate according to coordinate information comprised in the attribute information of each of the at least one valid key point comprises:

performing averaging processing on coordinates corresponding to the coordinate information of each of the at least one valid key point to obtain the reference coordinate, and/or

determining the coordinate information in the processed attribute information of each valid key point according to the reference coordinate and to the coordinate information in the attribute information of each of the at least one valid key point comprises:

determining, with the reference coordinate as an origin point, processed coordinate information corresponding to the coordinate information of each of the at least one valid key point.

6. The method according to claim 4 or 5, wherein inputting the processed attribute information of the plurality of key points to the preset neural network for processing to obtain the bounding box position of the target object comprises:

inputting the processed attribute information of the plurality of key points to the preset neural network for processing to obtain output position information; and

determining the bounding box position of the target object according to the reference coordinate and the output position information.

7. The method according to any one of claims 1 to 6, wherein the neural network comprises at least two full connection layers.

8. The method according to any one of claims 1 to 7, wherein the neural network comprises three full connection layers, wherein an activation function of at least one of the first full connection layer and the second full connection layer of the three full connection layers

comprises a Rectified Linear Unit (ReLU) activation function.

9. An apparatus for determining a bounding box of a target object, comprising:

an obtaining module configured to obtain attribute information of each of a plurality of key points of a target object; and

a determining module configured to determine a bounding box position of the target object according to the attribute information of each of the plurality of key points of the target object obtained by the obtaining module and a preset neural network,

wherein the attribute information of the key point comprises coordinate information and a presence determination value.

10. The apparatus according to claim 9, wherein the determining module comprises:

a first sub-module configured to determine at least one valid key point from the plurality of key points according to the attribute information of each of the plurality of key points obtained by the obtaining module;

a second sub-module configured to process, according to attribute information of each of the at least one valid key point determined by the first sub-module, the attribute information of the plurality of key points to obtain processed attribute information of the plurality of key points; and

a third sub-module configured to input the processed attribute information of the plurality of key points obtained by the second sub-module to the preset neural network for processing to obtain the bounding box position of the target object,

wherein the processed attribute information of the plurality of key points comprises processed attribute information of each of the at least one valid key point and attribute information of key points other than the at least one valid key point in the plurality of key points.

11. The apparatus according to claim 10, wherein the second sub-module comprises:

a first unit configured to determine a reference coordinate according to coordinate information comprised in the attribute information of each of the at least one valid key point

determined by the first sub-module; and

a second unit configured to determine coordinate information in the processed attribute information of each valid key point according to the reference coordinate determined by the first unit and to the coordinate information in the attribute information of each of the at least one valid key point.

12. The apparatus according to claim 11, wherein the first unit is configured to

perform averaging processing on coordinates corresponding to the coordinate information of each of the at least one valid key point determined by the first sub-module to obtain the reference coordinate, and/or

the second unit is configured to

determine, with the reference coordinate determined by the first unit as an origin point, processed coordinate information corresponding to the coordinate information of each of the at least one valid key point.

13. The apparatus according to claim 11 or 12, wherein the third sub-module is configured to:

input the processed attribute information of the plurality of key points obtained by the second sub-module to the preset neural network for processing to obtain output position information; and

determine the bounding box position of the target object according to the reference coordinate and the output position information.

14. The apparatus according to any one of claims 9 to 13, wherein the neural network comprises at least two full connection layers.

15. The apparatus according to any one of claims 9 to 14, wherein the neural network comprises three full connection layers, wherein an activation function of at least one of the first full connection layer and the second full connection layer of the three full connection layers comprises a Rectified Linear Unit (ReLU) activation function.

16. A computer-readable storage medium having instructions stored thereon, wherein when

the instructions are executed by a processor, the method according to any one of claims 1 to 8 is executed.

17. A program for causing a computer to execute the method according to any one of claims 1 to 8.