CLAIMS

1. A method of completing point cloud data, comprising:

acquiring first point cloud data, wherein the first point cloud data comprises incomplete point cloud data of a target object in a scene scanned by a point cloud collecting device;

acquiring second point cloud data of the target object by completing the first point cloud data with a point cloud completion network, wherein the second point cloud data indicates complete point cloud data that represents a complete shape of the target object;

wherein, the point cloud completion network is trained based on complete point cloud data and configured to generate third point cloud data according to target latent space vector, and a difference between fourth point cloud data acquired from the third point cloud data by performing preset degradation and real point cloud data collected from a physical space is within a preset difference range.

2. The method of claim 1, further comprising:

acquiring raw point cloud data collected by a point cloud collecting device from the physical space;

acquiring the first point cloud data by performing point cloud segmentation on the raw point cloud data; and / or

associating a plurality of frames of the second point cloud data.

3. The method of claim 1 or 2, wherein the point cloud completion network is acquired based on the following:

training an initial point cloud completion network based on sample complete point cloud data;

acquiring the third point cloud data which is generated by the trained point cloud completion network based on the target latent space vector;

acquiring the point cloud completion network by optimizing the trained point cloud completion network based on the real point cloud data and the fourth point cloud data.

4. The method of any of claims 1 to 3, wherein

acquiring a plurality of point cloud blocks in the third point cloud data;

for each of the plurality of point cloud blocks, determining a points-distribution feature of the point cloud block;

establishing a loss function based on respective points-distribution features of the plurality of point cloud blocks;

optimizing the trained point cloud completion network based on the loss function.

5. The method of any of claims 1 to 4, wherein

acquiring a plurality of initial latent space vectors sampled from a latent space;

for each of the initial latent space vectors, determining a target function of the initial latent space vector based on point cloud data corresponding to the initial latent space vector and the real point cloud data;

determining the target latent space vector from the initial latent space vectors based on respective target functions of the initial latent space vectors.

6. The method of any of claims 1 to 5, wherein the preset degradation comprises:

for each of a plurality of target points in the real point cloud data, determining one or more points adjacent to the target point in the third point cloud data as neighbor

points of the target point;

taking a union of respective neighbor points of the plurality of target points in the real point cloud data as the fourth point cloud data acquired from the third point cloud data by performing preset degradation.

7. A method of training point cloud completion network, the point cloud completion network being applicable to a method of completing point cloud data according to any one of claims 1 to 6, the method of training point cloud completion network comprising:

training an initial point cloud completion network based on sample complete point cloud data, wherein the sample complete point cloud data comprises point cloud data that represents a complete shape of a target object;

acquiring completed point cloud data which is generated by the trained point cloud completion network based on target latent space vector;

optimizing the trained point cloud completion network based on real point cloud data collected from a physical space and degraded point cloud data acquired from the completed point cloud data by performing preset degradation, such that a difference between the degraded point cloud data and the real point cloud data is within a preset difference range.

8. A method of processing point cloud data, comprising:

acquiring first to-be-processed point cloud data and second to-be-processed point cloud data in a game area, wherein the first to-be-processed point cloud data corresponds to a game participant and the second to-be-processed point cloud data corresponds to a game object;

acquiring first processed point cloud data by completing the first to-be-processed point cloud data with a point cloud completion network and acquiring second processed point cloud data by completing the second to-be-processed point cloud data with the point cloud completion network;

associating the first processed point cloud data and the second processed point cloud data;

wherein, the point cloud completion network is trained based on complete point cloud data and configured to generate completed point cloud data according to target latent space vector, and a difference between real point cloud data collected from a physical space and degraded point cloud data acquired from the completed point cloud data by performing preset degradation is within a preset difference range.

9. The method of claim 8, wherein the game object comprises a game coin placed into the game area, and the method further comprises, based on the association of the first processed point cloud data and the second processed point cloud data, performing at least one of the following operations:

determining one or more game coins placed by the game participant in the game area;

determining an action performed by the game participant on the game object.

10. The method of claim 8 or 9, wherein acquiring the first to-be-processed point cloud data and the second to-be-processed point cloud data in a game area comprises:

acquiring raw point cloud data collected by a point cloud collecting device set around the game area;

acquiring the first to-be-processed point cloud data corresponding to the game

participant and the second to-be-processed point cloud data corresponding to the game object by performing point cloud segmentation on the raw point cloud data.

11. The method of any of claims 8 to 10, wherein

the point cloud completion network is configured to complete the first to-be-processed point cloud data corresponding to game participants of a plurality of categories and/or the second to-be-processed point cloud data corresponding to game objects of a plurality of categories; or

the point cloud completion network comprises:

a first point cloud completion network configured to complete the first to-be-processed point cloud data corresponding to game participant of a first category, and

a second point cloud completion network configured to complete the second to-be-processed point cloud data corresponding to game object of a second category.

12. A method of processing point cloud data, comprising:

acquiring to-be-processed point cloud data corresponding to a target object in a game area, wherein the target object comprises at least one of a game participant and a game object;

acquiring processed point cloud data by completing the to-be-processed point cloud data with a point cloud completion network;

identifying the target object based on the processed point cloud data;

wherein, the point cloud completion network is trained based on complete point cloud data and configured to generate completed point cloud data according to target latent space vector, and a difference between real point cloud data collected from a physical space and degraded point cloud data acquired from the completed point cloud

data by performing preset degradation is within a preset difference range.

13. An apparatus for completing point cloud data, comprising:

a first acquiring module, configured to acquire first point cloud data, wherein the first point cloud data comprises incomplete point cloud data of a target object in a scene scanned by a point cloud collecting device;

a point cloud completion module, configured to acquire second point cloud data of the target object by completing the first point cloud data with a point cloud completion network, wherein the second point cloud data indicates complete point cloud data that represents a complete shape of the target object;

wherein, the point cloud completion network is trained based on complete point cloud data and configured to generate third point cloud data according to target latent space vector, and a difference between fourth point cloud data acquired from the third point cloud data by performing preset degradation and real point cloud data collected from a physical space is within a preset difference range.

14. An apparatus for training point cloud completion network, the point cloud completion network being applicable to an apparatus for completing point cloud data according to claim 13, the apparatus for training point cloud completion network comprising:

a training module, configured to train an initial point cloud completion network based on sample complete point cloud data, wherein the sample complete point cloud data comprises point cloud data that represents a complete shape of a target object;

a second acquiring module, configured to acquire completed point cloud data which is generated by the trained point cloud completion network based on target latent

space vector;

an optimizing module, configured to optimize the trained point cloud completion network based on real point cloud data collected from a physical space and degraded point cloud data acquired from the completed point cloud data by performing preset degradation, such that a difference between the degraded point cloud data and the real point cloud data is within a preset difference range.

15. An apparatus for processing point cloud data, comprising:

a third acquiring module, configured to acquire first to-be-processed point cloud data and second to-be-processed point cloud data in a game area, wherein the first to-be-processed point cloud data corresponds to a game participant and the second to-be-processed point cloud data corresponds to a game object;

an inputting module, configured to acquire first processed point cloud data by completing the first to-be-processed point cloud data with a point cloud completion network and acquire second processed point cloud data by completing the second to-be-processed point cloud data with the point cloud completion network;

associating module, configured to associate the first processed point cloud data and the second processed point cloud data;

wherein, the point cloud completion network is trained based on complete point cloud data and configured to generate completed point cloud data according to target latent space vector, and a difference between real point cloud data collected from a physical space and degraded point cloud data acquired from the completed point cloud data by performing preset degradation is within a preset difference range.

16. An apparatus for processing point cloud data, comprising:

a fourth acquiring module, configured to acquire to-be-processed point cloud data corresponding to a target object in a game area, wherein the target object comprises at least one of a game participant and a game object;

a fifth acquiring module, configured to acquire processed point cloud data by completing the to-be-processed point cloud data with a point cloud completion network;

an identifying module, configured to identify the target object based on the processed point cloud data,

wherein, the point cloud completion network is trained based on complete point cloud data and configured to generate completed point cloud data according to target latent space vector, and a difference between real point cloud data collected from a physical space and degraded point cloud data acquired from the completed point cloud data by performing preset degradation is within a preset difference range.

17. A system for processing point cloud data, comprising:

a point cloud collecting device set around a game area, for collecting first to-be-processed point cloud data and second to-be-processed point cloud data in a game area, wherein the first to-be-processed point cloud data corresponds to a game participant and the second to-be-processed point cloud data corresponds to a game object; and

a processing unit communicatively connected to the point cloud collecting device, for acquiring first processed point cloud data by completing the first to-be-processed point cloud data with a point cloud completion network and acquiring second processed point cloud data by completing the second to-be-processed point cloud data with the point cloud completion network, and associating the first processed point cloud data and the second processed point cloud data;

wherein, the point cloud completion network is trained based on complete point

cloud data and configured to generate completed point cloud data according to target latent space vector, and a difference between real point cloud data collected from a physical space and degraded point cloud data acquired from the completed point cloud data by performing preset degradation is within a preset difference range.

18. A system for processing point cloud data, the system comprising:

a point cloud collecting device set around a game area, for collecting to-be-processed point cloud data corresponding to a target object in a game area, wherein the target object comprises at least one of a game participant and a game object; and

a processing unit communicatively connected to the point cloud collecting device, for acquiring processed point cloud data by completing the to-be-processed point cloud data with a point cloud completion network, and identifying the target object based on the processed point cloud data;

wherein, the point cloud completion network is trained based on complete point cloud data and configured to generate completed point cloud data according to target latent space vector, and a difference between real point cloud data collected from a physical space and degraded point cloud data acquired from the completed point cloud data by performing preset degradation is within a preset difference range.

19. A computer readable storage medium storing a computer program, when the computer program is executed by a processor, the method according to any one of claims 1 to 12 is implemented.

20. A computer device, comprising a memory, a processor and a computer program stored on the memory and executable on the processor, when the computer program is

executed by a processor, the method according to any one of claims 1 to 12 is implemented.