CLAIMS

What is claimed is:

1. A projection data processing method, comprising:

obtaining, by a terminal, network status information, wherein the network status information indicates quality of a communication link between the terminal and a projection device;

determining, by the terminal, a target resolution of a to-be-projected image based on the network status information; and

synthesizing, by the terminal, image data based on the target resolution, and sending the image data to the projection device, wherein the image data is used by the projection device to display the to-be-projected image.

2. The method according to claim 1, wherein

the target resolution is positively correlated with the quality of the communication link.

3. The method according to claim 1 or 2, wherein

the network status information comprises a received signal strength indicator RSSI.

4. The method according to claim 3, wherein

the determining, by the terminal, a target resolution of a to-be-projected image based on the network status information comprises:

if a value of the RSSI is greater than or equal to a first threshold, determining, by the terminal, that the target resolution is a first resolution;

if a value of the RSSI is less than a first threshold and is greater than or equal to a second threshold, determining, by the terminal, that the target resolution is half of a first resolution, wherein the second threshold is less than the first threshold; or

if a value of the RSSI is less than a second threshold, determining, by the terminal, that the target resolution is one-third of a first resolution.

5. The method according to any one of claims 1 to 4, wherein the method further comprises:

determining, by the terminal, a current usage scenario; and

the synthesizing, by the terminal, image data based on the target resolution comprises: selectively synthesizing, by the terminal, the image data based on the usage scenario and the target resolution.

6. The method according to claim 5, wherein the determining, by the terminal, a current usage

scenario comprises:

determining, by the terminal, whether the to-be-projected image is in a full-screen scenario; and

the selectively synthesizing, by the terminal, the image data based on the usage scenario and the target resolution comprises:

if the terminal determines that the to-be-projected image is in the full-screen scenario, synthesizing, by the terminal, only an application layer of all layers of the to-be-projected image based on the target resolution; or

if the terminal determines that the to-be-projected image is in a non-full-screen scenario, synthesizing, by the terminal, a system layer of the to-be-projected image and an application layer based on the target resolution.

7. The method according to claim 6, wherein the determining, by the terminal, whether the to-be-projected image is in a full-screen scenario comprises:

if a source resolution of the application layer is greater than or equal to a third threshold, determining, by the terminal, that the to-be-projected image is in the full-screen scenario; or

if a source resolution of the application layer is less than a third threshold, determining, by the terminal, that the to-be-projected image is in the non-full-screen scenario.

8. The method according to claim 6, wherein the determining, by the terminal, whether the to-be-projected image is in a full-screen scenario comprises:

if a pixel aspect ratio of the application layer is the same as a pixel aspect ratio of a screen, determining, by the terminal, that the to-be-projected image is in the full-screen scenario; or

if a pixel aspect ratio of the application layer is different from a pixel aspect ratio of a screen, determining, by the terminal, that the to-be-projected image is in the non-full-screen scenario.

9. The method according to claim 6, wherein the determining, by the terminal, whether the to-be-projected image is in a full-screen scenario comprises:

if a source resolution of the application layer is greater than or equal to a third threshold, and a pixel aspect ratio of the application layer is the same as a pixel aspect ratio of a screen, determining, by the terminal, that the to-be-projected image is in the full-screen scenario; or

if a source resolution of the application layer is less than a third threshold, or a pixel aspect ratio of the application layer is different from a pixel aspect ratio of a screen, determining, by the terminal, that the to-be-projected image is in the non-full-screen scenario.

10. The method according to claim 6, wherein the determining, by the terminal, whether the to-be-projected image is in a full-screen scenario comprises:

if a source resolution of the application layer is greater than or equal to a third threshold, a pixel aspect ratio of the application layer is the same as a pixel aspect ratio of a screen, and a preset layer identifier set comprises an identifier of the application layer, determining, by the terminal, that the to-be-projected image is in the full-screen scenario; or

if a source resolution of the application layer is less than a third threshold, a pixel aspect ratio of the application layer is different from a pixel aspect ratio of a screen, or a preset layer identifier set does not comprise an identifier of the application layer, determining, by the terminal, that the to-be-projected image is in the non-full-screen scenario.

11. The method according to any one of claims 1 to 10, wherein the synthesizing, by the terminal, image data based on the target resolution comprises:

synthesizing, by the terminal, the image data based on the target resolution and a first frame rate, wherein the first frame rate is lower than a frame rate at which the to-be-projected image is displayed on the terminal.

12. A projection data processing method, comprising:

receiving, by a projection device, a to-be-projected image of a first resolution;

performing, by the projection device, super-resolution on the to-be-projected image of the first resolution based on a preset neural network model by using a graphics processing unit GPU, to obtain an image of a second resolution; and

displaying, by the projection device, the image of the second resolution.

13. The method according to claim 12, wherein the method further comprises:

the to-be-projected image comprises a first image frame; and

the performing, by the projection device, super-resolution on the image of the first resolution based on a preset neural network model by using a graphics processing unit GPU, to obtain an image of a second resolution comprises:

performing, by the projection device, decoding and super-resolution on the first image frame in one audio and video synchronization period, to obtain decoded image data of the second resolution.

14. The method according to claim 12 or 13, wherein the method further comprises:

if a first frame rate of the to-be-projected image is less than a fourth threshold, performing,

by the projection device, frame interpolation on the to-be-projected image to obtain a to-be-projected image of a second frame rate.

15. The method according to any one of claims 12 to 14, wherein

the to-be-projected image of the first resolution comprises the synthesized image data according to any one of claims 1 to 11.

16. A projection data processing apparatus, comprising:

an obtaining unit, configured to obtain network status information, wherein the network status information indicates quality of a communication link between a terminal and a projection device;

a determining unit, configured to determine a target resolution of a to-be-projected image based on the network status information; and

a synthesizing unit, configured to synthesize image data based on the target resolution, and send the image data to the projection device, wherein the image data is used by the projection device to display the to-be-projected image.

17. The apparatus according to claim 16, wherein

the target resolution is positively correlated with the quality of the communication link.

18. The apparatus according to claim 16 or 17, wherein

the network status information comprises a received signal strength indicator RSSI.

19. The apparatus according to claim 18, wherein the determining unit is specifically configured to:

if a value of the RSSI is greater than or equal to a first threshold, determine that the target resolution is a first resolution;

if a value of the RSSI is less than a first threshold and is greater than or equal to a second threshold, determine that the target resolution is half of a first resolution, wherein the second threshold is less than the first threshold; or

if a value of the RSSI is less than a second threshold, determine that the target resolution is one-third of a first resolution.

20. The apparatus according to any one of claims 16 to 19, wherein the determining unit is further configured to:

determine a current usage scenario; and

the synthesizing unit is specifically configured to: selectively synthesize the image data based on the usage scenario and the target resolution.

21. The apparatus according to claim 20, wherein

the determining unit is specifically configured to:

determine whether the to-be-projected image is in a full-screen scenario; and

the synthesizing unit is specifically configured to:

if it is determined that the to-be-projected image is in the full-screen scenario, synthesize only an application layer of all layers of the to-be-projected image based on the target resolution; or

if it is determined that the to-be-projected image is in a non-full-screen scenario, synthesize a system layer of the to-be-projected image and an application layer based on the target resolution.

22. The apparatus according to claim 21, wherein the determining unit is specifically configured to:

if a source resolution of the application layer is greater than or equal to a third threshold, determine that the to-be-projected image is in the full-screen scenario; or

if a source resolution of the application layer is less than a third threshold, determine that the to-be-projected image is in the non-full-screen scenario.

23. The apparatus according to claim 21, wherein the determining unit is specifically configured to:

if a pixel aspect ratio of the application layer is the same as a pixel aspect ratio of a screen, determine that the to-be-projected image is in the full-screen scenario; or

if a pixel aspect ratio of the application layer is different from a pixel aspect ratio of a screen, determine that the to-be-projected image is in the non-full-screen scenario.

24. The apparatus according to claim 21, wherein the determining unit is specifically configured to:

if a source resolution of the application layer is greater than or equal to a third threshold, and a pixel aspect ratio of the application layer is the same as a pixel aspect ratio of a screen, determine that the to-be-projected image is in the full-screen scenario; or

if a source resolution of the application layer is less than a third threshold, or a pixel aspect ratio of the application layer is different from a pixel aspect ratio of a screen, determine that the to-be-projected image is in the non-full-screen scenario.

25. The apparatus according to claim 21, wherein the determining unit is specifically configured to:

if a source resolution of the application layer is greater than or equal to a third threshold, a

pixel aspect ratio of the application layer is the same as a pixel aspect ratio of a screen, and a preset layer identifier set comprises an identifier of the application layer, determine that the to-be-projected image is in the full-screen scenario; or

if a source resolution of the application layer is less than a third threshold, a pixel aspect ratio of the application layer is different from a pixel aspect ratio of a screen, or a preset layer identifier set does not comprise an identifier of the application layer, determine that the to-be-projected image is in the non-full-screen scenario.

26. The apparatus according to any one of claims 16 to 25, wherein

the synthesizing unit is specifically configured to:

synthesize the image data based on the target resolution and a first frame rate, wherein the first frame rate is lower than a frame rate at which the to-be-projected image is displayed on the terminal.

27. A projection data processing apparatus, comprising:

a receiving unit, configured to receive a to-be-projected image of a first resolution;

an obtaining unit, configured to perform super-resolution on the to-be-projected image of the first resolution based on a preset neural network model by using a graphics processing unit GPU, to obtain an image of a second resolution; and

a display unit, configured to display the image of the second resolution.

28. The apparatus according to claim 27, wherein

the to-be-projected image comprises a first image frame; and

the obtaining unit is specifically configured to:

perform decoding and super-resolution on the first image frame in one audio and video synchronization period, to obtain decoded image data of the second resolution.

29. The apparatus according to claim 27 or 28, wherein the apparatus further comprises:

a processing unit, configured to: if a first frame rate of the to-be-projected image is less than a fourth threshold, perform frame interpolation on the to-be-projected image to obtain a to-be-projected image of a second frame rate.

30. The apparatus according to any one of claims 27 to 29, wherein

the to-be-projected image of the first resolution comprises the synthesized image data according to any one of claims 15 to 24.

31. A projection system, comprising a transmit end and a receive end, wherein the transmit

end is connected to the receive end through a wireless communication link;

the transmit end comprises the projection data processing apparatus according to any one of claims 16 to 26; and

the receive end comprises the projection data processing apparatus according to any one of claims 27 to 30.

32. A terminal, comprising one or more processors and a memory, wherein

the memory stores computer-readable instructions; and

the one or more processors read the computer-readable instructions, and the terminal is enabled to implement the method according to any one of claims 1 to 11.

33. A projection device, comprising one or more processors and a memory, wherein

the memory stores computer-readable instructions; and

the one or more processors read the computer-readable instructions, and the terminal is enabled to implement the method according to any one of claims 12 to 15.

34. A computer-readable storage medium, comprising computer-readable instructions, wherein when the computer-readable instructions are run on a computer, the computer is enabled to perform the method according to any one of claims 1 to 15.