CLAIMS

What is claimed is:

1. A method for determining human eye close degrees, performed by a hardware device, comprising:

acquiring a face image;

determining a human eye open amplitude and a reference distance in the face image, the reference distance is a distance from a nose top to a nose tip;

calculating a relative amplitude of the human eye open amplitude relative to the reference distance;

acquiring a maximum relative amplitude, the maximum relative amplitude is the relative amplitude of a maximum value of the human eye open amplitude in a plurality of face images of a same face relative to the reference distance; and

calculating a human eye close weight in the face image based on the relative amplitude and the maximum relative amplitude, the human eye close weight being configured to measure a human eye close degree.

2. The method according to claim 1, wherein determining the human eye open amplitude and the reference distance in the face image comprises:

acquiring face key points by performing a face key point detection on the face image; identifying human eye key points and reference key points from the face key points; calculating the human eye open amplitude based on the human eye key points; and calculating the reference distance based on the reference key points.

3. The method according to claim 2, wherein identifying the human eye key points from the face key points comprises:

identifying eye key points from the face key points; and

selecting an eye top key point and an eye bottom key point from the eye key points as the human eye key points.

4. The method according to claim 2, wherein the human eye key points comprise an eye top key point and an eye bottom key point, and calculating the human eye open amplitude based on the human eye key points comprises:

calculating a distance between the eye top key point and the eye bottom key point, and determining the distance as the human eye open amplitude.

5. The method according to claim 2, wherein identifying the reference key points from the face key points comprises:

identifying nose key points from the face key points; and

selecting a nose top key point and a nose tip key point from the nose key points as the reference key points.

6. The method according to claim 2, wherein the reference key points comprise a nose top key point and a nose tip key point, and calculating the reference distance based on the reference key points comprises:

calculating a distance between the nose top key point and the nose tip key point, and determining the distance as the reference distance.

7. The method according to any one of claims 1 to 6, wherein calculating the human eye close weight in the face image based on the relative amplitude and the maximum relative amplitude comprises:

acquiring a human eye close amplitude by calculating a ratio of the relative amplitude to the maximum relative amplitude, the human eye close amplitude being positively correlated with the relative amplitude and negatively correlated with the maximum relative amplitude; and

calculating the human eye close weight by using the human eye close amplitude and a predetermined human eye close constant.

8. A method for controlling eyes, performed by a hardware device, comprising:

acquiring a face image and a face model;

acquiring a human eye close weight in the face image, the human eye close weight being configured to measure a human eye close degree; and

controlling an eye in the face model based on the human eye close weight;

wherein the human eye close weight is determined by the method for determining human eye close degrees as defined in any one of claims 1 to 7.

9. The method according to claim 8, wherein controlling the eye in the face model based on the human eye close weight comprises:

acquiring a predetermined human eye open amplitude in the face model;

calculating a target human eye open amplitude based on human the eye close weight and the predetermined human eye open amplitude; and

adjusting the human eye open amplitude in the face model to the target human eye open

amplitude.

10. The method according to claim 9, wherein calculating the target human eye open amplitude based on the human eye close weight and the predetermined human eye open amplitude comprises:

determining that the target human eye open amplitude is 0 in response to the human eye close weight being greater than a predetermined value.

11. A method for controlling eyes, comprising:

playing video data comprising a plurality of frames of image data, the image data comprising a face image;

displaying a face model to cover the face image;

determining a human eye open amplitude and a reference distance in the face image of each of the frames, the reference distance is a distance from a nose top to a nose tip;

calculating a relative amplitude of the human eye open amplitude relative to the reference distance;

acquiring a maximum relative amplitude, the maximum relative amplitude is the relative amplitude of a maximum value of the human eye open amplitude in a plurality of face images of a same face relative to the reference distance;

calculating a human eye close weight in the face image based on the relative amplitude and the maximum relative amplitude; and

driving, based on the human eye close weight, an eye in the face model to blink.

12. The method according to claim 11, wherein acquiring the maximum relative amplitude comprises:

acquiring a plurality of relative amplitudes of human eye open amplitudes relative to the reference distance in the plurality of frames of face images; and

determining a maximum value from the plurality of relative amplitudes, and determining the maximum value as the maximum relative amplitude.

13. An apparatus for determining human eye close degrees, comprising: a face image acquiring module, configured to acquire a face image;

a face data determining module, configured to determine a human eye open amplitude and a reference distance in the face image, the reference distance is a distance from a nose top to a nose tip;

a relative amplitude calculating module, configured to calculate a relative amplitude of the human eye open amplitude relative to the reference distance;

a maximum relative amplitude acquiring module, configured to acquire a maximum relative amplitude, the maximum relative amplitude is the relative amplitude of a maximum value of the human eye open amplitude in a plurality of face images of a same face relative to the reference distance; and

a human eye close weight calculating module, configured to calculate a human eye close weight in the face image based on the relative amplitude and the maximum relative amplitude, the human eye close weight being configured to measure a human eye close degree.

14. An apparatus for controlling eyes, comprising:

a face image and face model acquiring module, configured to acquire a face image and a face model;

a human eye close weight acquiring module, configured to acquire a human eye close weight in the face image, the human eye close weight being configured to measure a human eye close degree; and

an eye controlling module, configured to control an eye in the face model based on the human eye close weight;

wherein the human eye close weight is determined by the apparatus for determining eye close degrees as defined in claim 13.

15. An apparatus for controlling eyes, comprising:

a playing module, configured to play video data comprising a plurality of frames of image data, the image data comprising a face image;

a face model displaying module, configured to display a face model to cover the face image;

a face data determining module, configured to determine a human eye open amplitude and a reference distance in the face image of each of the frames, the reference distance is a distance from a nose top to a nose tip;

a relative amplitude calculating module, configured to calculate a relative amplitude of the human eye open amplitude relative to the reference distance;

a maximum relative amplitude acquiring module, configured to acquire a maximum relative amplitude, the maximum relative amplitude is the relative amplitude of a maximum value of the human eye open amplitude in a plurality of face images of a same face relative to the reference distance;

a human eye close weight calculating module, configured to calculate a human eye close weight in the face image based on the relative amplitude and the maximum relative amplitude; and

a model driving module, configured to drive, based on the human eye close weight, an eye in the face model to blink.

16. A device, comprising:

at least one processor; and

a storage device storing at least one program therein,

wherein the at least one program, when run by the at least one processor, causes the at least one processor to perform at least one of: the method for determining human eye close degrees as defined in any one of claims 1 to 7, the method for controlling eyes as defined in any one of claims 8 to 10, and the method for controlling eyes as defined in any one of claims 11 and 12.

17. A computer-readable storage medium storing a computer program therein, wherein the computer program, when run by a processor, causes the processor to perform at least one of: the method for determining human eye close degrees as defined in any one of claims 1 to 7, the method for controlling eyes as defined in any one of claims 8 to 10, and the method for controlling eyes as defined in any one of claims 11 and 12.