

WHAT IS CLAIMED IS:

1. An electronic device, comprising: a memory, a processor and a photographic device, the memory comprising a lip movement capturing program and the lip movement capturing program being executed by the processor to implement the following steps of:

a real-time facial image acquisition step: acquiring a real-time image shot by a photographic device and extracting a real-time facial image from the real-time image by use of a face recognition algorithm;

a feature point recognition step: inputting the real-time facial image into a pretrained lip average model and recognizing t lip feature points representative of positions of lips in the real-time facial image by use of the lip average model; and

a lip movement judgment step: calculating a movement direction and movement distance of the lips in the real-time facial image according to x and y coordinates of the t lip feature points in the real-time facial image.

2. The electronic device of claim 1, wherein the lip movement judgment step comprises:

calculating a distance between an inner-side central feature point of the upper lip and inner-side central feature point of the lower lip in the real-time facial image and judging an opening degree of the lips;

connecting a left-side outer mouth corner feature point with feature points, closest to the left-side outer mouth corner feature point, on outer contour lines of the upper and lower lips to form vectors $\vec{V}_1$ and $\vec{V}_2$ respectively, and calculating an

included angle between the vectors $\vec{V_1}$ and $\vec{V_2}$ to obtain a leftward curling degree of the lips; and

connecting a right-side outer mouth corner feature point with feature points, closest to the right-side outer mouth corner feature point, on the outer contour lines of the upper and lower lips to form vectors $\vec{V_3}$ and $\vec{V_4}$ respectively, and calculating an included angle between the vectors $\vec{V_3}$ and $\vec{V_4}$ to obtain a rightward curling degree of the lips.

3. The electronic device of claim 2, wherein the feature point recognition step further comprises:

aligning the real-time facial image and the lip average model and searching the real-time facial image for the t lip feature points matched with t lip feature points of the lip average model by use of a feature extraction algorithm.

4. The electronic device of claim 3, wherein the training steps for the lip average model comprise:

establishing a sample library with n facial images and marking t feature points at a lip part in each facial image in the sample library, the t feature points being uniformly distributed at the upper and lower lips and left and right mouth corners; and training a facial feature recognition model by use of the facial images marked with the lip feature points to obtain the lip average model about faces.

5. A lip movement capturing method, applied to an electronic device and comprising:

a real-time facial image acquisition step: acquiring a real-time image shot by a photographic device and extracting a real-time facial image from the real-time image by use of a face detection algorithm;

a feature point recognition step: inputting the real-time facial image into a pretrained lip average model and recognizing t lip feature points representative of positions of lips in the real-time facial image by use of the lip average model; and

a lip movement judgment step: calculating a movement direction and movement distance of the lips in the real-time facial image according to x and y coordinates of the t lip feature points in the real-time facial image.

6. The lip movement capturing method of claim 5, wherein the lip movement judgment step comprises:

calculating a distance between an inner-side central feature point of the upper lip and inner-side central feature point of the lower lip in the real-time facial image and judging an opening degree of the lips;

connecting a left-side outer mouth corner feature point with feature points, closest to the left-side outer mouth corner feature point, on outer contour lines of the upper and lower lips to form vectors $\vec{v}_1$ and $\vec{v}_2$ respectively, and calculating an included angle between the vectors $\vec{v}_1$ and $\vec{v}_2$ to obtain a leftward curling degree of the lips; and

connecting a right-side outer mouth corner feature point with feature points, closest to the right-side outer mouth corner feature point, on the outer contour lines of the upper and lower lips to form vectors $\vec{v}_3$ and $\vec{v}_4$ respectively, and calculating an included angle between the vectors $\vec{v}_3$ and $\vec{v}_4$ to obtain a rightward curling degree of the lips.

7. The lip movement capturing method of claim 6, wherein the feature point recognition step further comprises:

aligning the real-time facial image and the lip average model and searching the real-time facial image for the t lip feature points matched with t lip feature points of the lip average model by use of a feature extraction algorithm.

8. The lip movement capturing method of claim 7, wherein training steps for the lip average model comprise:

establishing a sample library with n facial images and marking t feature points at a lip part in each facial image in the sample library, the t feature points being uniformly distributed at the upper and lower lips and left and right mouth corners; and training a facial feature recognition model by use of the facial images marked with the lip feature points to obtain the lip average model about faces.

9. The lip movement capturing method of claim 5, wherein the face recognition algorithm comprises a geometric-feature-based method, a local feature analysis method, an eigenface method, an elastic-model-based method and a neural network method.

10. A computer-readable storage medium, comprising a lip movement capturing program, the lip movement capturing program being executed by a processor to implement the following steps of:

a real-time facial image acquisition step: acquiring a real-time image shot by a photographic device and extracting a real-time facial image from the real-time image by use of a face recognition algorithm;

a feature point recognition step: inputting the real-time facial image into a pretrained lip average model and recognizing t lip feature points representative of positions of lips in the real-time facial image by use of the lip average model; and

a lip movement judgment step: calculating a movement direction and movement

distance of the lips in the real-time facial image according to x and y coordinates of the t lip feature points in the real-time facial image.

11. The computer-readable storage medium of claim 10, wherein the lip movement judgment step comprises:

calculating a distance between an inner-side central feature point of the upper lip and inner-side central feature point of the lower lip in the real-time facial image and judging an opening degree of the lips;

connecting a left-side outer mouth corner feature point with feature points, closest to the left-side outer mouth corner feature point, on outer contour lines of the upper and lower lips to form vectors $\vec{v}_1$ and $\vec{v}_2$ respectively, and calculating an included angle between the vectors $\vec{v}_1$ and $\vec{v}_2$ to obtain a leftward curling degree of the lips; and

connecting a right-side outer mouth corner feature point with feature points, closest to the right-side outer mouth corner feature point, on the outer contour lines of the upper and lower lips to form vectors $\vec{v}_3$ and $\vec{v}_4$ respectively, and calculating an included angle between the vectors $\vec{v}_3$ and $\vec{v}_4$ to obtain a rightward curling degree of the lips.

12. The computer-readable storage medium of claim 11, wherein the feature point recognition step further comprises:

aligning the real-time facial image and the lip average model and searching the real-time facial image for the t lip feature points matched with t lip feature points of the lip average model by use of a feature extraction algorithm.

13. The computer-readable storage medium of claim 12, wherein training steps for the lip average model comprise:

establishing a sample library with n facial images and marking t feature points at a lip part in each facial image in the sample library, the t feature points being uniformly distributed at the upper and lower lips and left and right mouth corners; and

training a facial feature recognition model by use of the facial images marked with the lip feature points to obtain the lip average model about faces.