

CLAIMS

1. A method for recommending collocating dress, comprising:

obtaining a first dress image from an input image, wherein the first dress feature comprises a semantic dress feature and a numerical dress feature;

obtaining a first dress feature of the first dress image;

obtaining, based on the first dress feature, a second dress feature matching the first dress feature from a collocation database, the second dress feature being a dress feature of a second dress image; and

obtaining, based on the second dress feature, a dress image identical to and/or similar to the second dress image from a recommendation database as a collocating dress image,

wherein the obtaining, based on the first dress feature, a second dress feature matching the first dress feature from a collocation database comprises:

obtaining, based on the first dress feature and a dress feature in at least one collocation storage entry of the collocation database, at least one dress feature identical to and/or similar to the first dress feature from the collocation database, wherein the at least one dress feature identical to and/or similar to the first dress feature is a dress feature obtained from at least one dress image identical to and/or similar to the first dress image, and the at least one dress image identical to and/or similar to the first dress image is a dress image obtained by filtering candidate images according to their respective semantic dress features, the candidate images being obtained based on numerical dress features and having degrees of similarity with the first dress image that satisfy a preset condition; and

obtaining the matching second dress feature from a collocation storage entry corresponding to the at least one dress feature identical to and/or similar to the first dress feature.

2. The method according to claim 1, further comprising: before the obtaining a first dress image from an input image,

obtaining at least two dress features of each of a plurality of collocation reference images acquired; and

storing the at least two dress features corresponding to each collocation reference image in

one collocation storage entry of the collocation database, wherein the at least two dress features in each collocation storage entry have a matching relationship.

3. The method according to claim 1 or 2, further comprising: before the obtaining a first dress image from an input image,

obtaining a dress feature corresponding to each of a plurality of dress images acquired; and

classifying the plurality of dress images based on the dress feature corresponding to each of the plurality of dress images, and storing the plurality of dress images into the recommendation database according to a classification result of the plurality of dress images.

4. The method according to any one of claims 1 to 3, wherein the obtaining a first dress image from an input image comprises:

performing dress detection on the input image to obtain a position and a size of the first dress image; and

obtaining the first dress image from the input image based on the position and size of the first dress image.

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

the semantic dress feature is used for expressing an attribute feature of the first dress image in form of text; and

the numerical dress feature is used for expressing the attribute feature of the first dress image with a matrix or an array.

6. The method according to claim 5, wherein the obtaining a first dress feature of the first dress image comprises:

obtaining a pixel matrix of the first dress image, wherein the pixel matrix comprises pixels of multiple positions in the first dress image;

determining a dress feature matrix of the first dress image according to the pixel matrix of the first dress image; and

determining the numerical dress feature of the first dress image based on the dress feature matrix.

7. The method according to claim 5 or 6, wherein the obtaining a first dress feature of the first dress image comprises:

obtaining a semantic tag probability array of the first dress image, wherein the semantic tag probability array comprises at least one semantic tag probability, and the semantic tag probability is used for representing a probability value of the first dress image in terms of attributes; and

obtaining the semantic dress feature of the first dress image based on the semantic tag probability array.

8. The method according to any one of claims 1 to 7, wherein the obtaining a first dress feature of the first dress image comprises:

obtaining the dress feature of the first dress image by means of a convolutional neural network; and

wherein the method further comprises:

training an initial convolutional neural network model by using sample images in advance, to obtain the convolutional neural network, wherein the sample images are annotated with a dress feature.

9. The method according to claim 1, wherein the obtaining, based on the first dress feature and dress features in at least one collocation storage entry of the collocation database, at least one dress feature identical to and/or similar to the first dress feature from the collocation database comprises:

obtaining distances between a numerical dress feature of the first dress feature and numerical dress features of the dress features in the collocation database, respectively;

selecting one or more dress features, in the collocation database, having a shortest distance from the numerical dress feature of the first dress feature as first candidate features; and

selecting a first candidate feature identical to the semantic dress feature of the first dress feature as the at least one dress feature identical to and/or similar to the first dress feature.

10. The method according to any one of claims 1 to 9, wherein the obtaining, based on the second dress feature, a dress image identical to and/or similar to the second dress image from a recommendation database as a collocating dress image comprises:

selecting, based on the second dress feature and the dress features of the plurality of dress images in the recommendation database, at least one dress feature identical to and/or similar to the second dress feature from the recommendation database; and

taking the dress image corresponding to the at least one dress feature identical to and/or similar to the second dress feature as the collocating dress image.

11. The method according to claim 10, wherein the selecting, based on the second dress feature and dress features of the plurality of dress images in the recommendation database, at least one dress feature identical to and/or similar to the second dress feature from the recommendation database comprises:

obtaining distances between a numerical dress feature of the second dress feature and numerical dress features of the plurality of dress images in the recommendation database, respectively;

selecting one or more dress features, in the recommendation database, having a shortest distance from the numerical dress feature of the second dress feature as second candidate features; and

selecting the second candidate feature identical to the semantic dress feature of the second dress feature as the at least one dress feature identical to and/or similar to the second dress feature.

12. The method according to any one of claims 1 to 11, further comprising: after the obtaining a dress image identical to and/or similar to the second dress image from a recommendation database as a collocating dress image,

outputting the collocating dress image; and/or

synthesizing the first dress image with the collocating dress image to obtain one or more collocation effect images, and outputting the collocation effect images.

13. The method according to claim 12, further comprising:

outputting related feature information of a collocating dress, wherein the related feature information is used for at least one of: describing at least part of features of the collocating dress different from other dresses, or used for describing the collocation effect of the collocating dress and the dress corresponding to the first dress image.

14. An apparatus for recommending collocating dress, comprising:

an image acquisition unit, configured to obtain a first dress image from an input image, wherein the first dress feature comprises a semantic dress feature and a numerical dress feature;

a feature acquisition unit, configured to obtain a first dress feature of the first dress image;

a dress collocation unit, configured to obtain, based on the first dress feature, a second dress feature matching the first dress feature from a collocation database, the second dress feature being a dress feature of a second dress image; and

a dress recommendation unit, configured to obtain, based on the second dress feature, a dress image identical to and/or similar to the second dress image from a recommendation database as a collocating dress image,

wherein the dress collocation unit is further configured to:

obtain, based on the first dress feature and a dress feature in at least one collocation storage entry of the collocation database, at least one dress feature identical to and/or similar to the first dress feature from the collocation database, wherein the at least one dress feature identical to and/or similar to the first dress feature is a dress feature obtained from at least one dress image identical to and/or similar to the first dress image, and the at least one dress image identical to and/or similar to the first dress image is a dress image obtained by filtering candidate images according to their respective semantic dress features, the candidate images being obtained based on numerical dress features and having degrees of similarity with the first dress image that satisfy a preset condition; and

obtain the matching second dress feature from a collocation storage entry corresponding to the at least one dress feature identical to and/or similar to the first dress feature.

15. The apparatus according to claim 14, wherein the collocation data is configured to store multiple collocation storage entries obtained based on a plurality of collocation reference images acquired, and each collocation storage entry has at least two dress features corresponding to the plurality of collocation reference images; the at least two dress features are obtained based on the collocation reference images acquired; and the at least two dress features in each collocation storage entry have a matching relationship.

16. The apparatus according to claim 14 or 15, wherein the recommendation database is configured to classify and store a plurality of dress images acquired, the plurality of dress images being classified according to the dress features corresponding to the dress images.

17. An electronic device, comprising: a memory configured to store executable instructions; and a processor, configured to communicate with the memory to execute the executable instructions so as to complete operations of a method for recommending collocating dress, the method comprising:

- obtaining a first dress image from an input image, wherein the first dress feature comprises a semantic dress feature and a numerical dress feature;

- obtaining a first dress feature of the first dress image;

- obtaining, based on the first dress feature, a second dress feature matching the first dress feature from a collocation database, the second dress feature being a dress feature of a second dress image; and

- obtaining, based on the second dress feature, a dress image identical to and/or similar to the second dress image from a recommendation database as a collocating dress image,

- wherein the obtaining, based on the first dress feature, a second dress feature matching the first dress feature from a collocation database comprises:

- obtaining, based on the first dress feature and a dress feature in at least one collocation storage entry of the collocation database, at least one dress feature identical to and/or similar to the first dress feature from the collocation database, wherein the at least one dress feature identical to and/or similar to the first dress feature is a dress feature obtained

from at least one dress image identical to and/or similar to the first dress image, and the at least one dress image identical to and/or similar to the first dress image is a dress image obtained by filtering candidate images according to their respective semantic dress features, the candidate images being obtained based on numerical dress features and having degrees of similarity with the first dress image that satisfy a preset condition; and

obtaining the matching second dress feature from a collocation storage entry corresponding to the at least one dress feature identical to and/or similar to the first dress feature.

18. A computer-readable storage medium configured to store computer-readable instructions, wherein when the instructions are executed, operations of the method for recommending collocating dress according to any one of claims 1 to 13 are implemented.

19. A computer program, comprising computer readable codes, wherein when the computer readable codes are operated on a device, a processor in the device executes instructions for implementing each operation in the method for recommending collocating dress according to any one of claims 1 to 13.