

PICTURE SYNTHESIS METHOD AND APPARATUS

The present application claims the priority to Chinese Patent Application No. 201510145112.0, filed on March 30, 2015 and entitled “Picture synthesis method and apparatus”, which is hereby incorporated by reference in its entirety.

Technical field

The present application relates to the technical field of Internet, and in particular to a picture synthesis method and apparatus.

Background art

Internet-based promotion activities are often in the form of diffusing pictures on web pages or social media platforms. In some activities, a number of different pictures need to be generated for numerous users within a short time. These pictures are usually generated by combining original materials. For example, with regard to original materials composed of a background image, a foreground image and foreground text, the foreground image and foreground text are drawn at designated positions of the background image, then the picture synthesis can be accomplished.

In the prior art, the application of a client/server structure usually uses two methods to synthesize a picture. The first one is that the server delivers, after combining original materials into a picture, the same to the client; and the second one is that the server sends the original materials and a guidance file indicating how to combine the original materials into a picture to the client, and the client combines the original materials and then generates a picture according to the guidance file.

In an application scenario where a large number of different pictures need to be generated within a short time, since combining original materials into a picture needs a certain processing time, the first method may result in an excessive pressure at the server end, which has a great challenge for the processing performance of the server and the number of servers; and since the total number of bytes of original materials required for synthesizing a picture is far more than the number of bytes of the picture, the second method may consume relatively high user traffic, which may further result in a too slow response speed for a user with a limited network bandwidth, and bring poor experience to the user.

Summary of the invention

In view of this, the present application provides a picture synthesis method, applied to a server, the method comprising:

receiving a request for a picture from a user via a client; and

delivering a common image of the picture, original materials for generating a dedicated image of the picture and a configuration file to the client, for the client to generate the picture using the received original materials and common image according to the configuration file, the common image being generated by some of the original materials of the picture.

The present application further provides a picture synthesis apparatus, applied to a server, the apparatus comprising:

a request receiving unit, configured to receive a request for a picture from a user via a client; and

a material response unit, configured to deliver a common image of the picture, original materials for generating a dedicated image of the picture and a configuration file to the client, for the client to generate the picture using the received original materials and common image according to the configuration file, the common image being generated by some of the original materials of the picture.

It can be seen from the above technical solution that, by synthesizing a common image of a picture on a server and synthesizing a dedicated image of the picture on a client, the embodiments of the present application not only significantly reduce the load of the server, which can achieve high-concurrency picture synthesis under the condition of occupying a small number of server resources, but also limit the size of original materials needing to be transmitted to the client, which reduces the traffic consumption of the client.

Brief description of the accompanying drawings

Fig. 1 is two pictures used in a promotion activity in one example;

Fig. 2 is a flow chart of a picture synthesis method in an embodiment of the present application;

Fig. 3 is a common image of pictures in the example of Fig. 1;

Fig. 4 is a schematic diagram of the composition of a resource file package in the example of Fig. 1;

Fig. 5 is a schematic diagram of the processing procedure of a client and a server when a synthesized picture is generated in an application example of the present application;

Fig. 6 is an example diagram of a picture synthesized on a client in the example of Fig. 1;

Fig.6 is a hardware structure diagram of a server which applies an embodiment of the present application; and

Fig. 8 is a logical structure diagram of a picture synthesis apparatus in an embodiment of the present application.

Detailed description

In promotion activities, a large number of different pictures needing to be generated within a short time usually have more common elements, for example, an identical background image, a corporation logo, an activity name, etc., while there are usually less differences among the pictures. For example, two password pictures used in an activity of entering a password and snatching a red envelope launched by AliPay are as shown in Fig. 1, where both the background picture element and prompt copywriting of the two pictures are the same, only the password and amount information are changed.

According to the above characteristics of the pictures, in the embodiments of the present application, a picture needing to be generated is divided into two parts: a common image which can be commonly used for a plurality of users and a dedicated image corresponding to a user, and a picture is formed by combining these two parts. The specific combination methods are various. For example, the dedicated image is displayed on the background of the common image, the dedicated image is connected to a certain boundary of the common image, etc. The common image may correspond to a service type, services of a certain type have at least one common image, and common images applied by different types of services are different. The common image may also correspond to a user type, users of a certain type have at least one common image, and common images applied by different types of users are different. The common image may also correspond to a service type and a user type; and the dedicated image may correspond to one or more users; this is not limited in the embodiments of the present application.

The embodiments of the present application propose a novel picture synthesis method,

where a common image is generated at a server end, and the common image and some original materials for generating a dedicated image are synthesized into a picture at a client, which can both reduce the picture synthesis operation of the server and reduce the bandwidth required for delivering the original materials to the client, thereby solving the problem in the prior art. The method in this embodiment is applied to a server, and the procedure thereof is as shown in Fig. 2.

Step 211, receiving a request for a picture from a user via a client.

Step 220, delivering a common image of the picture, original materials for generating a dedicated image of the requested picture and a configuration file to the client which requests the picture, for the client to generate the requested picture using the received original materials and common image according to the configuration file.

the common image being generated by some of the original materials of the requested picture. With regard to a great number of pictures needing to be presented to users at the client, common parts are extracted therefrom, and these common parts are classified into a common image. It needs to be noted that the common image may be a common part applicable to all the users, and may also be a common part applicable to some users. The constitutional parts, except the common image, in the picture correspond to a dedicated image of a user.

When the common image and the dedicated image are divided, the convenience degree of combining original materials when the picture is generated and the beautifulness degree of the generated picture may also be taken into consideration, so as to classify some picture elements which can be commonly used for a plurality of users into the dedicated image. Still taking the password pictures in Fig. 1 as an example, although the words “amount of red envelope” and “yuan” exist in both pictures, considering that changing the spacing of that line of words as the amount changes will be more neat and beautiful, the whole line of words can be classified as the dedicated image, and the corresponding common image is as shown in Fig. 3.

Some original materials for synthesizing the common image are chosen from all the original materials required for synthesizing the picture, and the server utilizes this part of original materials to generate the common image. Before receiving a request for a picture from a user via the client, the server may use some of the original materials of the picture to generate the common image in advance; and such a method is applicable to the situation where the common image is irrelevant to the specific contents requested by the user. Also, after receiving a request for a picture from a user via the client, the server may use some of the original materials of the picture to generate the common image according to the received request; and such a method is

applicable to the situation where the common image may be different because of the specific contents requested by the user.

After receiving the request for a picture from the client, the server delivers the common image, the original materials required for generating the dedicated image of the requested picture and the configuration file to the client, wherein the configuration file comprises operation information required for synthesizing the common image and the delivered original materials into the picture, or, the configuration file is used for notifying the client of how to combine the common image and the other delivered original materials into the picture. For example, in the configuration file, a drawing method and drawing positions of the original materials and common image, and special processing to be performed on the original materials or common image, etc. may be described. For another example, the configuration file may comprise: drawing the original materials for generating the dedicated image on the common image, and the positions, sizes and/or rotation angles to draw the original materials, or comprise a calculation method for determining the drawing positions, sizes and/or rotation angles.

After receiving the above contents delivered by the server, the client may synthesize the common image and the received original materials into a picture according to the configuration file. From the perspective of the client, the common image is also one of the original materials for synthesizing the picture, and therefore the client may use a method for synthesizing a picture in the prior art to implement such process, and this will not be described. In addition, when drawing a picture, the client may synthesize the contents entered by the user via the client, a designated image, and/or other materials together into the picture; and the user may also customize how to synthesize the above materials with the common image and the received original materials into a picture.

According to different practical application scenarios, the server may use different methods to deliver the configuration file and the original materials for generating the dedicated image of the requested picture.

For example, for each user, the server may generate a configuration file to be used by the user and generate original materials required for generating a dedicated image of a picture for the user.

For another example, with regard to pictures having the same common image, the server may deliver all the original materials required for generating dedicated images of these pictures and configuration files corresponding to all the original materials to the client; that is to say, the

server delivers the same common image, original materials and configuration files to different users. After receiving a request for a picture from a user via the client, the server generates text information corresponding to the user according to the request of the client, and delivers the generated text information to the client. The delivered text information indicates the original materials to be used to generate the dedicated image of the user, and the client uses the original materials corresponding to the text information and the common image according to the configuration file, and then the picture of the user can be generated. Since hardware resources occupied to process text information are far less than resources for image processing, such a method further alleviates the load of the server.

In some application scenarios, the common features of pictures of different types of services presented at the client are different. In these scenarios, the server may generate, according to a service type to which the picture is applied, a common image corresponding to the service type, and packages the common image corresponding to the service type, all the original materials required for generating a dedicated image of the picture applied to the service type and the configuration file into a resource file package corresponding to the service type. After receiving a request for a picture of the service type from the client, the server generates text information about the service type according to the received request, and delivers the generated text information and the resource file package corresponding to the service type to the client which requests the service type. In combination with the configuration file and the text information, the client synthesizes the common image and some of the original materials in the resource file package into a picture.

It can be seen that in the embodiments of the present application, the common image is generated at the server end, and the common image and some of the original materials are synthesized into a picture at the client, so that the server only needs to generate a small number of pictures to satisfy the requirements of all the users, which greatly reduces the load of the server; and the client also only needs to receive a small number of original materials to generate a picture, which reduces the traffic consumption of the client.

It needs to be noted that the server in this embodiment may be a logical or physical server, may also be two or more than two logical or physical servers, and these servers collaboratively accomplish various steps in the above method.

In one application example of the present application, the server side comprises two logical servers, a service server and a picture server, wherein the service server is used for receiving and

responding to a service request of the client; and the picture server is used for generating and delivering a resource file package corresponding to the requested service type to the client.

On the picture server, with regard to a picture used by each service type, a common image and a dedicated image of the picture are divided, and the common image corresponding to the service type is generated in advance; and the picture server packages all the original materials required for generating a dedicated image of picture for a certain service type, a common image corresponding to the service type, and a configuration file referring to these original materials and the common image into a resource file package corresponding to the service type and stores same.

Taking the password picture of the service type of an AliPay red envelope as an example, the composition of the resource file package generated for the service type on the picture server is as shown in Fig. 4, wherein bg.jpg is the common image of all the user password pictures; config is the configuration file; and the other files are all the original materials required for generating the dedicated image of the password picture, and each Chinese character and symbol that may be used in the dedicated image is one original material of an image format.

Fig. 5 shows a processing procedure of a client and a server when a synthesized picture is generated, where a user initiates a request for a picture for a certain service type to a service server via a client; after receiving the request sent from the client, the service server sends an instruction of delivering a resource file package to a picture server, the instruction comprising a service type of the resource file package and an address of the client for the delivery; and the service server generates, according to the request of the client, text information corresponding to the user and returns the same to the client. The picture server receives the instruction of the service server, and delivers the resource file package corresponding to the service type in the instruction to the client in the instruction. After receiving the text information from the service server, and the resource file package from the picture server, the client generates a complete picture and presents the same to the user.

In one example, assuming that a user requests a service server for a password picture of an AliPay red envelope via a client, the service server generates text information comprising “amount of red envelope 0-9 yuan”, and “password = 85599” and delivers the same to the client. In a resource file package delivered from a picture server to the client, the config file comprises the following contents:

“width”: 640,

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“height”: 1135,

“fonts”: {

“0”: {

“path”: “0.png” // the original material corresponding to the number “0” is 0.png

},

“red”: {

“path”: “10.png” // the original material corresponding to the Chinese character “red” is
10.png

},

},

“variables”: {

“password”: {

“type”: “text”,

“x”: 110, // a start point coordinate x of the line “password”

“y”: 740, // a start point coordinate y of the line “password”

“angle”: 0, // an inclined angle of the character string of the line “password”

“length”: 420, // the length of the character string “password”

“rotate”: 0, // the maximum angle that a single character of the line “password” can
randomly rotate

“fongColor”: “0xff59493f” // the color of the character string of the line “password”

},

}

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The client finds the original material corresponding to each character, number or symbol in the configuration file according to “amount of red envelope 0-9 yuan” in the text information, and then draws the original materials according to designated positions and sizes in the configuration file on the common image. With regard to “password = 85599” in the text information, according to a designated position and drawing format for the password in the configuration file, “85599” is drawn on the common image. The picture synthesized on the client is as shown in Fig. 6.

In the configuration file, a calculation method for factors of positions, sizes and rotation angles, etc. for drawing the original materials can further be designated. For example, a character string comprising N characters is to be drawn on a straight line taking (x, y) as a start point, the length being length and the inclined angle (an included angle with the X axis) being angle, the central position of the original material image corresponding to the ith character can be designated in the configuration file as:

$$(x_i, y_i) = (x + (i * length/N) * \cos(angle), y + (i * length/N) * \sin(angle))$$

the size of the original material image when each character is drawn can be designated as:

$$(width, height) = (length/N, length/N)$$

and if we want each character to randomly rotate a certain angle, the rotation angle of the original material image when each character is drawn can be designated as:

$$angle + random(rotate) - rotate/2$$

wherein rotate is the maximum angle that the original material image of each character can randomly rotate based on the inclined angle of the straight line.

Corresponding to the above procedure, the embodiments of the present application further provide a picture synthesis apparatus. The apparatus may be implemented using software, and may also be implemented using hardware or a combination of software and hardware. Taking the software implementation as an example, as an apparatus in the logical sense, it is formed by a CPU (Central Process Unit) of a computing device where it is located to read a corresponding computer program instruction into a memory for running. From the hardware level, in addition to

the CPU, memory and non-volatile memory shown in Fig. 7, the device where the apparatus for generating a synthesized picture is located generally further comprises other hardware such as a board card for implementing a network communication function, etc.

Fig. 8 shows a picture synthesis apparatus provided by the embodiments of the present application, applied to a server, and dividing the apparatus in terms of functions, the apparatus comprises a request receiving unit and a material response unit, wherein: the request receiving unit is configured to receive a request for a picture from a user via a client; and the material response unit is configured to deliver a common image of the picture, original materials for generating a dedicated image of the picture and a configuration file to the client, for the client to generate the picture using the received original materials and common image according to the configuration file, the common image being generated by some of the original materials of the picture.

Optionally, the apparatus further comprises: a text response unit, configured to generate, according to the request, text information corresponding to the user and deliver the same to the client, the text information being used for the client to generate the picture using original materials and a common image corresponding to the text information according to the configuration file.

Optionally, the common image comprises a common image generated, according to a service type to which the picture is applied, using some of the original materials and corresponding to the service type; the apparatus further comprises: a resource file package generation unit, configured to package the common image corresponding to the service type, all the original materials required for generating a dedicated image applied to the service type and the configuration file into a resource file package; and the material response unit is specifically configured to: deliver the resource file package to a client which requests the service type.

Optionally, the apparatus further comprises a first common image unit or a second common image unit, wherein: the first common image unit is configured to, before receiving a request for a picture from a user via a client, use some of the original materials of the picture to generate the common image in advance; and the second common image unit is configured to, after receiving a request for a picture from a user via a client, use some of the original materials of the picture to generate the common image according to the request.

Optionally, the configuration file comprises: positions, sizes and/or rotation angles for drawing the original materials for generating the dedicated image on the common image, or a

calculation method for determining the positions, sizes and/or rotation angles.

The descriptions presented above are only preferred embodiments of the present application, and are not intended to limit the present application. Any modification, equivalent replacement, improvement, etc. within the spirit and principle of the present application shall all fall within the scope of protection of the present application.

In a typical configuration, a computing device includes one or more processors (CPUs), an input/output interface, a network interface and a memory.

The memory may include a non-permanent memory, a random access memory (RAM) and/or a non-volatile memory (such as a read-only memory (ROM) or flash memory (flash RAM)) and so on in computer-readable mediums. The memory is an example of the computer-readable mediums.

The computer-readable mediums comprise permanent and non-permanent, removable and non-removable media and may realize information storage with any method or technology. The information may be a computer-readable instruction, data structure, program module or other data.

The examples of computer storage media include but are not limited to a phase change memory (PRMA), static random access memory (SRAM), dynamic random access memory (DRAM), other types of random access memories (RAMs), read-only memory (ROM), electrically erasable programmable read-only memory (EEPROM), flash memory or other memory technologies, compact disk read-only memory (CD-ROM), digital versatile disc or other optical storage, magnetic cassette tape, magnetic tape and magnetic disk storage or other magnetic storage devices or any other non-transmission media, which can be used to store information that can be accessed by a computing device. According to the definition herein, the computer-readable mediums do not include transitory media, such as modulated data signals and carriers.

It also needs to be noted that the terms “including”, “comprising” or any other variations thereof are intended to cover non-exhaustive inclusion, so that processes, methods, merchants or devices including a series of elements not only include those elements but also include other elements which are not listed expressly or include all inherent elements of such processes, methods, merchants or devices. If no more limitations are made, an element limited by “comprising a/an...” does not exclude other identical elements existing in the process, the method,

the merchant, or the device which includes the element.

It should be understood by those skilled in the art that the embodiments of the present application may be provided as methods, systems or computer program products. Thus, the present application may adopt full hardware embodiments, full software embodiments, or embodiments which combine software and hardware. Moreover, the present application may use a form of a computer program product that is implemented on one or more computer-usable storage mediums (including but not limited to a disk memory, a CD-ROM, an optical memory, and the like) that include computer usable program codes.

Claims

1. A picture synthesis method, applied to a server, characterized in that the method comprises:

receiving a request for a picture from a user via a client; and

delivering a common image of the picture, original materials for generating a dedicated image of the picture and a configuration file to the client, for the client to generate the picture using the received original materials and common image according to the configuration file, the common image being generated by some of the original materials of the picture.

2. The method according to claim 1, characterized in that the method further comprises: generating, according to the request, text information corresponding to the user and delivering the same to the client, the text information being used for the client to generate the picture using original materials and a common image corresponding to the text information according to the configuration file.

3. The method according to claim 2, characterized in that the common image comprises a common image generated, according to a service type to which the picture is applied, using some of the original materials and corresponding to the service type;

the method further comprises: packaging the common image corresponding to the service type, all the original materials required for generating a dedicated image applied to the service type and the configuration file into a resource file package; and

the delivering a common image, original materials for generating a dedicated image of the picture and a configuration file to the client comprises: delivering the resource file package to a client which requests the service type.

4. The method according to claim 1, characterized in that the method further comprises:

before receiving a request for a picture from a user via a client, using some of the original materials of the picture to generate the common image in advance; or

after receiving a request for a picture from a user via a client, using some of the original materials of the picture to generate the common image according to the request.

5. The method according to any one of claims 1 to 4, characterized in that the configuration file comprises: positions, sizes and/or rotation angles for drawing the original materials for generating the dedicated image on the common image, or a calculation method for determining the positions, sizes and/or rotation angles.

6. A picture synthesis apparatus, applied to a server, characterized in that the apparatus comprises:

a request receiving unit, configured to receive a request for a picture from a user via a client;
and

a material response unit, configured to deliver a common image of the picture, original materials for generating a dedicated image of the picture and a configuration file to the client, for the client to generate the picture using the received original materials and common image according to the configuration file, the common image being generated by some of the original materials of the picture.

7. The apparatus according to claim 6, characterized in that the apparatus further comprises: a text response unit, configured to generate, according to the request, text information corresponding to the user and deliver the same to the client, the text information being used for the client to generate the picture using original materials and a common image corresponding to the text information according to the configuration file.

8. The apparatus according to claim 7, characterized in that the common image comprises a common image generated, according to a service type to which the picture is applied, using some of the original materials and corresponding to the service type;

the apparatus further comprises: a resource file package generation unit, configured to package the common image corresponding to the service type, all the original materials required for generating a dedicated image applied to the service type and the configuration file into a resource file package; and

the material response unit is specifically configured to: deliver the resource file package to a client which requests the service type.

9. The apparatus according to claim 6, characterized in that the apparatus further comprises:

a first common image unit, configured to, before receiving a request for a picture from a

user via a client, use some of the original materials of the picture to generate the common image in advance; or

a second common image unit, configured to, after receiving a request for a picture from a user via a client, use some of the original materials of the picture to generate the common image according to the request.

10. The apparatus according to any one of claims 6 to 9, characterized in that the configuration file comprises:

positions, sizes and/or rotation angles for drawing the original materials for generating the dedicated image on the common image, or a calculation method for determining the positions, sizes and/or rotation angles.