

IMAGE PROCESSING METHOD, APPARATUS, AND DEVICE, COMPUTER READABLE STORAGE MEDIUM, AND PRODUCT

[0001] This application claims the priority to and benefits of the Chinese Patent Application, No.202311576691.5, which was filed on November 23, 2023. All the aforementioned patent applications are hereby incorporated by reference in their entireties.

TECHNICAL FIELD

[0002] Embodiments of the present disclosure relate to an image processing method and apparatus, a device, a computer-readable storage medium, and a product.

BACKGROUND

[0003] Users may acquire images on a terminal device or generate images through a network. In order to make the obtained images better fit the personalized needs of users, users may further perform expansion operations on the images to obtain larger-size images and improve image quality.

[0004] However, current image expansion methods generally expand images to a preset size, and the image processing effect is often relatively single, which cannot meet the actual needs of users.

SUMMARY

[0005] Embodiments of the present disclosure provide an image processing method and apparatus, a device, a computer-readable storage medium, and a product, which are used to solve the technical problem that the operation image processing effect of the existing image expansion method is relatively single.

[0006] In a first aspect, an embodiment of the present disclosure provides an image processing method, including:

[0007] displaying, in a content display page, an image to be processed and an image processing control associated with the image to be processed;

[0008] displaying an image processing page in response to a trigger operation of a user on the image processing control, where the image processing page includes the image to be processed, a size adjustment control, and a description information determination control;

[0009] acquiring a target size determined by the user based on the size adjustment control and target description information determined by the user based on the description information determination control; and

[0010] performing a size expansion operation on the image to be processed according to the target size and the target description information, to obtain a target image with the target size.

[0011] In a second aspect, an embodiment of the present disclosure provides an image processing apparatus, including:

- [0012] a displaying module, configured to display, in a content display page, an image to be processed and an image processing control associated with the image to be processed;
- [0013] a processing module, configured to display an image processing page in response to a trigger operation of a user on the image processing control, where the image processing page includes the image to be processed, a size adjustment control, and a description information determination control;
- [0014] an acquiring module, configured to acquire a target size determined by the user based on the size adjustment control and target description information determined by the user based on the description information determination control; and
- [0015] an expansion module, configured to perform a size expansion operation on the image to be processed according to the target size and the target description information, to obtain a target image with the target size.
- [0016] In a third aspect, an embodiment of the present disclosure provides an electronic device, including: a processor and a memory;
- [0017] the memory stores a computer-executable instruction; and
- [0018] the processor executes the computer-executable instruction stored in the memory, to cause the at least one processor to execute the image processing method according to the first aspect above and various possible designs of the first aspect.
- [0019] In a fourth aspect, an embodiment of the present disclosure provides a computer-readable storage medium, where a computer-executable instruction is stored in the computer-readable storage medium, and when the computer-executable instruction is executed by a processor, the image processing method according to the first aspect above and various possible designs of the first aspect is implemented.
- [0020] In a fifth aspect, an embodiment of the present disclosure provides a computer program product, including a computer program, where when the computer program is executed by a processor, the image processing method according to the first aspect above and various possible designs of the first aspect is implemented.

BRIEF DESCRIPTION OF DRAWINGS

- [0021] In order to more clearly explain the technical solutions in the embodiments of the present disclosure or in the prior art, the following will briefly introduce the drawings that need to be used in the description of the embodiments or the prior art. Obviously, the drawings in the following description are some embodiments of the present disclosure. For those of ordinary skill in the art, other drawings may be obtained based on these drawings without creative efforts.
- [0022] Fig. 1 is a schematic flowchart of an image processing method provided by an embodiment of the present disclosure;
- [0023] Fig. 2 is a schematic diagram of interface interaction provided by an embodiment of the present disclosure;
- [0024] Fig. 3 is a schematic diagram of a display interface provided by an embodiment of the present disclosure;

- [0025] Fig. 4 is a schematic flowchart of an image processing method provided by another embodiment of the present disclosure;
- [0026] Fig. 5 is a schematic diagram of another display interface provided by an embodiment of the present disclosure;
- [0027] Fig. 6 is a schematic diagram of another interface interaction provided by another embodiment of the present disclosure;
- [0028] Fig. 7 is a schematic diagram of another display interface provided by an embodiment of the present disclosure;
- [0029] Fig. 8 is a schematic diagram of another display interface provided by an embodiment of the present disclosure;
- [0030] Fig. 9 is a schematic flowchart of an image processing method provided by another embodiment of the present disclosure;
- [0031] Fig. 10 is a schematic structural diagram of an image processing apparatus provided by an embodiment of the present disclosure; and
- [0032] Fig. 11 is a schematic structural diagram of an electronic device provided by an embodiment of the present disclosure.

DETAILED DESCRIPTION

- [0033] In order to make the purpose, technical solutions and advantages of the embodiments of the present disclosure clearer, the technical solutions in the embodiments of the present disclosure will be clearly and completely described below in conjunction with the drawings in the embodiments of the present disclosure. Obviously, the described embodiments are part of the embodiments of the present disclosure, but not all of them. Based on the embodiments in the present disclosure, all other embodiments obtained by persons of ordinary skill in the art without creative efforts fall within the protection scope of the present disclosure.
- [0034] It may be understood that before using the technical solutions disclosed in the embodiments of the present disclosure, the user should be informed of the type, range of use, use scenarios, etc. of personal information involved in the present disclosure and obtain the authorization of the user in an appropriate manner in accordance with relevant laws and regulations.
- [0035] For example, in response to receiving an active request from a user, prompt information is sent to the user to clearly prompt the user that the requested operation will require access to and use of the user's personal information. In this way, the user may independently choose whether to provide personal information to software or hardware such as an electronic device, an application, a server or a storage medium that perform the operations of the technical solutions of the present disclosure based on the prompt information.
- [0036] As an optional but non-limiting implementation, in response to receiving an active request from a user, the manner of sending prompt information to the user may be, for example, a pop-up window, and the prompt information may be presented in the pop-up window in text. In addition, the pop-up window may also carry a

selection control for the user to select "agree" or "disagree" to provide personal information to the electronic device.

[0037] It may be understood that the above process of notifying and obtaining user authorization is only illustrative, and does not constitute a limitation on the implementation of the present disclosure, and other methods that meet relevant laws and regulations may also be applied to the implementation of the present disclosure.

[0038] In order to solve the technical problem that the operation image processing effect of the existing image expansion method is relatively single, the present disclosure provides an image processing method and apparatus, a device, a computer-readable storage medium, and a product.

[0039] It should be noted that, the image processing method and apparatus, the device, the computer-readable storage medium, and the product provided by the present disclosure may be applied to an application scenario of performing size expansion on any kind of image.

[0040] At present, image expansion methods generally only expand images to a specified size, for example, twice or three times the size of the original image. However, the image expansion methods are often relatively single and the operation is relatively complicated, which cannot meet the personalized needs of users.

[0041] In the process of solving the above technical problem, the inventors have found that an image processing control associated with an image to be processed may be provided in a content display page, so that the user may quickly perform an image expansion operation by means of a trigger operation on the image processing control. In addition, in response to the trigger operation of the user on the image processing control, an image processing page may be jumped to, and a size adjustment control and a description information determination control are displayed in the image processing page. In this way, the user may customize a target size based on the size adjustment control, so that the size of a target image obtained through the image expansion operation better fits the personalized needs of the user. In addition, target description information may also be determined by means of the description information determination control, so that the generated target image better fits the target description information of the user, thereby improving user experience.

[0042] Fig. 1 is a schematic flowchart of an image processing method provided by an embodiment of the present disclosure. As shown in Fig. 1, the method includes:

[0043] Step 101: displaying, in a content display page, an image to be processed and an image processing control associated with the image to be processed.

[0044] An execution body of this embodiment is an image processing apparatus, which may be coupled to a terminal device, so that a target size and target description information may be respectively determined based on human-computer interaction operations of a user with the terminal device, and an expansion operation is performed on the image to be processed based on the target size and the target description information.

[0045] Optionally, the image processing apparatus may be coupled to a server, and the server may be in communication connection with the terminal device, so that the target size and the target description information determined by the user on the terminal device may be acquired, an image expansion operation may be performed based on the target size and the target description information, and the terminal device may be controlled to display the generated target image.

- [0046] In this implementation, the image to be processed may be displayed in the content display page. The image to be processed may be an image acquired by the user in real time, or it may be an image uploaded by the user in a preset storage path, or it may be an image selected by the user from at least one generated image generated based on description information in the history, which is not limited in the present disclosure.
- [0047] Further, in order to facilitate the edit operation of the user on the image to be processed, the image processing control associated with the image to be processed may also be displayed in the content display page.
- [0048] Step 102: displaying an image processing page in response to a trigger operation of a user on the image processing control, where the image processing page includes the image to be processed, a size adjustment control, and a description information determination control.
- [0049] In this implementation, in response to the trigger operation of the user on the image processing control, the image processing page may be displayed, so that the user may perform an image expansion operation on the image to be processed on the image processing page.
- [0050] Optionally, the image to be processed, the size adjustment control, and the description information determination control are included in the image processing page. The image to be processed may be displayed on the upper side of the image processing page, and the size adjustment control and the description information determination control may be sequentially displayed on the lower side of the image to be processed.
- [0051] The user may determine the target size based on the size adjustment control, and then perform the expansion operation on the image to be processed based on the target size, and determine the target description information based on the description information determination control. The target description information is used to constrain the target image during the image expansion process, so that the expanded target image better fits the personalized needs of the user.
- [0052] Step 103: acquiring the target size determined by the user based on the size adjustment control and the target description information determined by the user based on the description information determination control.
- [0053] In this implementation, after the size adjustment control and the description information determination control are displayed in the image processing page, the user may determine the target size by means of a trigger operation on the size adjustment control, and then perform the expansion operation on the image to be processed based on the target size, so as to obtain the image to be processed with the target size. In addition, the user may also determine the target description information by means of a trigger operation on the description information determination control, so that the target image associated with the target description information may be generated.
- [0054] Step 104: performing a size expansion operation on the image to be processed according to the target size and the target description information, to obtain a target image with the target size.
- [0055] In this embodiment, after the target size and the target description information are respectively determined, the size expansion operation may be performed on the image to be processed based on the target size and the target description information, to obtain the target image with the target size.
- [0056] Fig. 2 is a schematic diagram of interface interaction provided by an embodiment of the present disclosure. As shown in Fig. 2, an image to be processed 22 and an image processing control 23 associated with

the image to be processed 22 may be displayed in a content display page 21. In response to a trigger operation of a user on the image processing control 23, an image processing page 24 may be displayed. The image to be processed 22, a size adjustment control 25, and a description information determination control 26 may be displayed in the image processing page 24. In this way, the user may determine a target size based on the size adjustment control 25 according to actual needs, and determine target description information based on the description information determination control 26. Further, a size expansion operation may be performed on the image to be processed based on the target size and the target description information, to obtain a target image with the target size.

[0057] According to the image processing method provided by this embodiment, the image processing control associated with the image to be processed is provided in advance, so that the user may quickly perform image expansion processing on the image to be processed based on the image processing control. Further, by providing the size adjustment control and the description information determination control in the image processing page, the user may more flexibly customize the image expansion size based on the size adjustment control. In addition, the user may also customize the description information based on the description information determination control, and the target image obtained after expanding the size of the image to be processed based on the target size and the target description information may better fit the personalized needs of the user. User experience may be improved on the basis of improving image expansion efficiency.

[0058] Optionally, based on any of the above embodiments, step 101 includes:

[0059] displaying at least one generated image in the content display page, where the at least one generated image is generated based on description information input by the user;

[0060] determining a target generated image triggered by the user as the image to be processed in response to a trigger operation of the user on the generated image; and

[0061] displaying the image to be processed and the image processing control in the content display page.

[0062] In this embodiment, the user may determine the description information according to actual needs, and generate at least one generated image based on the description information. For example, after determining the description information, the user may input the description information into a preset text-to-image model to obtain at least one generated image.

[0063] Optionally, at least one generated image may be displayed in the content display page, and in response to the trigger operation of the user on any generated image, the target generated image triggered by the user may be determined as the image to be processed. In order to facilitate the edit operation of the user on the image to be processed, the image to be processed and the image processing control may be displayed in the content display page.

[0064] According to the image processing method provided by this embodiment, the image to be processed and the image processing control are displayed in the content display page in response to the trigger operation of the user on the at least one generated image, so that the user may perform an image expansion operation on the image generated in the history according to actual needs, to improve the content quality of the generated image.

[0065] Further, based on any of the above embodiments, after step 102, it also includes:

- [0066] displaying a background canvas of a preset size in a first display area of the image processing page, and displaying the image to be processed on the background canvas according to a display scale that is preset between the canvas and the image to be processed; and
- [0067] displaying the size adjustment control and the description information determination control in a second display area of the image processing page.
- [0068] In this embodiment, the image processing page includes a first display area and a second display area. The image to be processed may be displayed in the first display area. In order to enable the user to more intuitively view the effect of image expansion, a background canvas of a preset size may also be displayed in the first display area of the image processing page, and the image to be processed is displayed on the background canvas according to a display scale that is preset between the canvas and the image to be processed. The display scale between the image to be processed and the background canvas may be 1:1.5, or the display scale may be 1:2, or the user may adjust the display scale according to actual needs, which is not limited in the present disclosure.
- [0069] Optionally, the image to be processed may be displayed at the center of the background canvas. The user may adjust the display position of the image to be processed in the background canvas according to actual needs. For example, the user may adjust the image to be processed to a specified position in the background canvas by means of a drag-and-drop operation on the image to be processed. Alternatively, a position adjustment control may also be provided in the image processing page, and the user may input position information by triggering the position adjustment control, so as to adjust the display position of the image to be processed based on the position information.
- [0070] Further, the size adjustment control and the description information determination control may be displayed in the second display area. The size adjustment control may be displayed on the upper side of the description information determination control.
- [0071] Optionally, the first display area and the second display area may be longitudinally arranged, for example, the first display area is displayed on the upper side of the second display area. Alternatively, the first display area and the second display area may be transversely arranged, for example, the first display area is displayed on the left side of the second display area. Alternatively, the user may adjust parameters such as the display position and display size of the first display area and the second display area according to actual needs, which is not limited in the present disclosure.
- [0072] Fig. 3 is a schematic diagram of a display interface provided by an embodiment of the present disclosure. As shown in Fig. 3, an image processing page 31 includes a first display area 32 and a second display area 33. A background canvas 34 of a preset size may be displayed in the first display area 32, and an image to be processed 35 is displayed on the background canvas 34 according to a display scale that is preset between the canvas and the image to be processed. A size adjustment control 36 and a description information determination control 37 are displayed in the second display area 33.
- [0073] According to the image processing method provided by this embodiment, the background canvas of the preset size is displayed in the first display area of the image processing page, and the image to be processed is displayed on the background canvas according to the display scale that is preset between the canvas and the

image to be processed, so that the user may preliminarily view the effect of image expansion. In addition, by displaying the size adjustment control and the description information determination control in the second display area of the image processing page, it is convenient for the user to determine the target size and the target description content according to actual needs, so that the generated target image better fits the personalized needs of the user.

[0074] Fig. 4 is a schematic flowchart of an image processing method provided by another embodiment of the present disclosure. Based on any of the above embodiments, as shown in Fig. 4, step 103 includes:

[0075] Step 401: determining a current size adjustment type in response to a trigger operation of the user on the size adjustment control.

[0076] Step 402: displaying a size adjustment area corresponding to the size adjustment type.

[0077] Step 403: acquiring the target size determined by the user in the size adjustment area.

[0078] In this embodiment, in order to enrich the effect of image expansion, different size adjustment types may be provided in advance. The size adjustment type includes but is not limited to an adjustment proportionally type and a scale change adjustment type. Therefore, in order to more accurately determine the target size, the current size adjustment type may first be determined.

[0079] Optionally, the size adjustment control may be displayed in the content processing page. The current size adjustment type is determined in response to the trigger operation of the user on the size adjustment control. After the size adjustment type is determined, the size adjustment area corresponding to the size adjustment type may be displayed. An adjustment control matching the size adjustment type may be provided in the size adjustment area. In this way, the user may determine the target size in the size adjustment area, so as to perform the expansion operation on the image to be processed based on the target size.

[0080] According to the image processing method provided by this embodiment, by providing different size adjustment types in advance, the diversity of image expansion may be further improved. In addition, after the size adjustment type is determined, the target size may be more accurately determined based on the size adjustment type.

[0081] Optionally, based on any of the above embodiments, the size adjustment control includes a first adjustment type control and a second adjustment type control. Step 401 includes:

[0082] determining, in response to a trigger operation of the user on the first adjustment type control or the second adjustment type control, the first adjustment type control or the second adjustment type control currently triggered by the user as the current size adjustment type.

[0083] Fig. 5 is a schematic diagram of another display interface provided by an embodiment of the present disclosure. As shown in Fig. 5, a first adjustment type control 52 and a second adjustment type control 53 may be respectively provided in an image processing page 51. The first adjustment type control 52 may be used to perform an image expansion operation according to an original scale of the image to be processed, and the second adjustment type control 53 may be used to adjust the scale and perform the image expansion operation according to the adjusted scale. The user may select a corresponding adjustment type for image processing according to actual needs.

- [0084] In this embodiment, the image processing method may be implemented on a handheld terminal device. When it is implemented on the handheld terminal device, the size adjustment control includes a first adjustment type control and a second adjustment type control. The first adjustment type control may be used to perform the expansion operation on the image to be processed in equal scale, and the second adjustment type control may be used to change the scale and expand.
- [0085] Optionally, the first adjustment type control and the second adjustment type control may be simultaneously displayed in the content processing page. In response to the trigger operation of the user on the first adjustment type control or the second adjustment type control, the first adjustment type control or the second adjustment type control currently triggered by the user is determined as the current size adjustment type.
- [0086] Alternatively, step 401 includes:
- [0087] displaying the first adjustment type control and the second adjustment type control that are preset in response to the trigger operation of the user on the size adjustment control; and
- [0088] determining, in response to a trigger operation of the user on the first adjustment type control or the second adjustment type control, the first adjustment type control or the second adjustment type control currently triggered by the user as the current size adjustment type.
- [0089] In this embodiment, the image processing method may be implemented on a large-screen device such as a computer. When it is implemented on the large-screen device, the preset first adjustment type control and the preset second adjustment type control are displayed in response to the trigger operation of the user on the size adjustment control. The first adjustment type control may be used to perform the expansion operation on the image to be processed in equal scale, and the second adjustment type control may be used to change the scale and expand. In response to the trigger operation of the user on the first adjustment type control or the second adjustment type control, the first adjustment type control or the second adjustment type control currently triggered by the user is determined as the current size adjustment type.
- [0090] Fig. 6 is a schematic diagram of another interface interaction provided by another embodiment of the present disclosure. As shown in Fig. 6, a size adjustment control 62 may be provided in an image processing page 61. In response to a trigger operation of a user on the size adjustment control 62, a first adjustment type control 63 and a second adjustment type control 64 may be displayed. The first adjustment type control 63 may be used to perform an image expansion operation according to an original scale of the image to be processed, and the second adjustment type control 64 may be used to adjust the scale and perform the image expansion operation according to the adjusted scale. The user may select a corresponding adjustment type for image processing according to actual needs.
- [0091] According to the image processing method provided by this embodiment, by setting different adjustment type determination modes for different terminal devices, the applicability of the image processing method may be improved, so that the user may perform the image expansion operation on both the handheld terminal device and the web end.
- [0092] Optionally, based on any of the above embodiments, step 402 includes:
- [0093] displaying a scale adjustment slide bar in the size adjustment area, where the scale adjustment slide bar includes at least one adjustment scale.

- [0094] In this embodiment, the size adjustment type includes the adjustment proportionally type. Under the adjustment proportionally type, the image to be processed may be expanded in equal scale. For example, an original scale of the image to be processed may be 1:1, and the image to be processed may be expanded to twice to obtain the target image, and the scale of the target image is the same as the original scale, which is still 1:1.
- [0095] Optionally, in order to facilitate the expansion operation of the user on the image to be processed, the scale adjustment slide bar may be displayed in the size adjustment area, where the scale adjustment slide bar includes at least one adjustment scale.
- [0096] The scale adjustment slide bar may support adjusting the adjustment scale from 1 time to 3 times. On the scale adjustment slide bar, adjustment scale nodes of 1.5, 2, 2.5, and 3 may be respectively set, so that the user may more intuitively understand the currently adjusted size.
- [0097] According to the image processing method provided by this embodiment, by displaying the scale adjustment slide bar in the size adjustment area, the user may quickly determine the target adjustment scale based on the scale adjustment slide bar.
- [0098] Further, based on any of the above embodiments, step 403 includes:
- [0099] determining a target adjustment scale determined by the user in response to an adjustment operation of the user on the scale adjustment slide bar; and
- [0100] determining the target size based on the target adjustment scale and an image size corresponding to the image to be processed.
- [0101] Alternatively, step 403 includes:
- [0102] in response to a drag-and-drop operation of the user on a size box at an edge of the image to be processed, performing an expansion operation on the size box in equal scale based on the drag-and-drop operation; and
- [0103] determining a size of the size box in response to the drag-and-drop operation being stopped, and determining the size of the size box as the target size.
- [0104] In this embodiment, after the scale adjustment slide bar is displayed in the size adjustment area, the user may determine the target adjustment scale based on a sliding operation on the scale adjustment slide bar. The scale adjustment slide bar may support adjusting the adjustment scale from 1 time to 3 times. Alternatively, the adjustment interval of the scale adjustment slide bar may be set by the user according to actual needs, which is not limited in the present disclosure.
- [0105] Optionally, the target adjustment scale determined by the user is determined in response to the adjustment operation of the user on the scale adjustment slide bar. The target size is determined based on the target adjustment scale and the image size corresponding to the image to be processed.
- [0106] As an implementable manner, after the image to be processed is displayed in the content processing page, the user may also determine the target size based on a drag-and-drop operation on a size box provided at an edge of the image to be processed.
- [0107] Optionally, in response to the drag-and-drop operation of the user on the size box at the edge of the image to be processed, the expansion operation is performed on the size box in equal scale based on the drag-

and-drop operation. The size of the size box when the drag-and-drop operation stops is determined, and the size of the size box is determined as the target size. The user may perform the drag-and-drop operation on any vertex of the size box.

- [0108] As an implementable manner, during the dragging process, the size box maintains the same scale as the image to be processed. Alternatively, the user may adjust the scale of the size box by means of dragging. For example, the original scale of the image to be processed may be 1:1, and in response to the drag-and-drop operation triggered by the user, the scale of the size box may be adjusted to 3:4, so that the target size may be subsequently determined based on the adjusted size box, and the target image with the scale of 3:4 may be obtained.
- [0109] Fig. 7 is a schematic diagram of another display interface provided by an embodiment of the present disclosure. As shown in Fig. 7, a first adjustment type control 72 and a second adjustment type control 73 may be respectively provided in an image processing page 71. When the user triggers the first adjustment type control 72, a scale adjustment slide bar 74 may be displayed in the image processing page 71. In this way, the user may determine the target size by adjusting the scale adjustment slide bar 74.
- [0110] According to the image processing method provided by this embodiment, the target size may be quickly and accurately determined based on the sliding operation of adjustment or the manual drag-and-drop operation, and the image expansion operation may be performed on the image to be processed based on the target size, so that the generated target image better fits the personalized needs of the user.
- [0111] Optionally, the size adjustment type includes the scale change adjustment type, and step 402 includes:
- [0112] displaying at least one canvas scale to be selected in the size adjustment area.
- [0113] In this embodiment, the size adjustment type includes the scale change adjustment type. Under the scale change adjustment type, the user may adjust the image expansion scale according to actual needs, so that it is different from the original scale of the image to be processed. For example, the original scale of the image to be processed may be 1:1, and under the scale change adjustment type, the user may select a target canvas scale of 3:4, so that a target image with a scale of 3:4 may be generated subsequently based on the target canvas scale selected by the user.
- [0114] Optionally, in order to facilitate the size adjustment operation of the user, when the size adjustment type selected by the user is the scale change adjustment type, at least one canvas scale to be selected may be displayed in the size adjustment area. The canvas scale to be selected includes but is not limited to 1:1, 3:4, 16:9, 4:3, 9:16, etc.
- [0115] Optionally, a content input control may also be displayed in the size adjustment area, so that the user manually inputs the target canvas scale based on actual needs. This is not limited in the present disclosure.
- [0116] According to the image processing method provided by this embodiment, by displaying at least one canvas scale to be selected in the size adjustment area, the user may more flexibly select the canvas scale to be selected according to actual needs, so that the scale of the generated target image better fits the personalized needs of the user, and the user experience is improved.
- [0117] Further, based on any of the above embodiments, after step 402, it also includes:

- [0118] determining a target canvas scale selected by the user in response to a selection operation of the user on the canvas scale to be selected; and
- [0119] displaying a background canvas matching the target canvas scale, and displaying the image to be processed on the background canvas according to a display scale that is preset between the image to be processed and the background canvas.
- [0120] In this embodiment, in order to enable the user to more intuitively view the image expansion effect corresponding to each canvas size to be selected, after the user selects the target canvas scale, the display effect of the image to be processed may be adjusted based on the target canvas scale.
- [0121] Optionally, in response to the selection operation of the user on the canvas scale to be selected, the canvas scale to be selected currently selected by the user may be determined as the target canvas scale. The background canvas matching the target canvas scale is displayed in the content processing page, and the image to be processed is displayed on the background canvas according to the display scale that is preset between the image to be processed and the background canvas. The display scale between the image to be processed and the background canvas may be 1:1.5, or the display scale may be 1:2, or the user may adjust the display scale according to actual needs, which is not limited in the present disclosure.
- [0122] According to the image processing method provided by this embodiment, based on the trigger operation of the user on the canvas scale to be selected, the image to be processed and the background canvas are displayed according to the target canvas scale selected by the user, so that the user may more intuitively view the image expansion effect corresponding to each canvas size to be selected.
- [0123] Further, based on any of the above embodiments, step 402 includes:
- [0124] determining a target canvas scale selected by the user in response to a selection operation of the user on the canvas scale to be selected;
- [0125] The target size is determined based on the target canvas scale and a display size of a display interface, so that a length or width of the target image expanded based on the target size is capable of filling the display interface.
- [0126] In this embodiment, after the target canvas scale is determined, the target size may be accurately determined based on the target canvas scale.
- [0127] Optionally, in response to the selection operation of the user on the canvas scale to be selected, the canvas scale to be selected currently selected by the user may be determined as the target canvas scale. The target size is determined based on the target canvas scale and the display size of the display interface, where after the image to be processed is expanded to the target size, the length or width of the target image may fill the display interface.
- [0128] Fig. 8 is a schematic diagram of another display interface provided by an embodiment of the present disclosure. As shown in Fig. 8, a first adjustment type control 82 and a second adjustment type control 83 may be respectively provided in an image processing page 81. When the user triggers the second adjustment type control 83, at least one canvas scale to be selected 84 may be displayed in the image processing page 81. In this way, the user may select the canvas scale to be selected according to actual needs, and then determine the target size based on the target canvas scale selected by the user.

- [0129] According to the image processing method provided by this embodiment, the target canvas scale selected by the user is determined in response to the selection operation of the user on the canvas scale to be selected, so that the target size may be accurately determined based on the target canvas scale, and the image expansion operation may be performed on the image to be processed based on the target size, so that the generated target image better fits the personalized needs of the user.
- [0130] Further, based on any of the above embodiments, step 103 includes:
- [0131] displaying historical description information associated with the image to be processed in the description information determination control; and
- [0132] acquiring description information that is edited by the user in response to an edit operation triggered by the user on the historical description information, and determining the description information that is edited as the target description information; and
- [0133] determining the historical description information as the target description information in response to the user not performing the edit operation on the historical description information.
- [0134] In this embodiment, the description information determination control may be displayed in the content display page. The description information determination control may be a content input box.
- [0135] Optionally, the historical description information associated with the image to be processed may be displayed in the description information determination control. The historical description information may be the text content used to generate the image to be processed. The user may edit the historical description information according to actual needs.
- [0136] Optionally, in response to the trigger operation of the user on the description information determination control, the historical description information in the description information determination control may be switched to an editable state. In the editable state, the user may perform an edit operation on the historical description information of the description information determination control. The edit operation includes but is not limited to edit operations such as addition, deletion, modification, and reconstruction.
- [0137] Optionally, when the user performs the edit operation on the historical description information, the edited description information may be determined as the target description information. On the contrary, in a case that the user does not perform the edit operation on the historical description information, the historical description information is determined as the target description information.
- [0138] According to the image processing method provided by this embodiment, the target description information is determined based on the trigger operation of the user on the description information determination control, so that the target description information may better fit the personalized needs of the user, and then a constraint operation may be performed on the target image based on the target description information during the image expansion process, to generate the target image that better fits the actual needs of the user.
- [0139] Fig. 9 is a schematic flowchart of an image processing method provided by another embodiment of the present disclosure. Based on any of the above embodiments, as shown in Fig. 9, step 104 includes:
- [0140] Step 901: inputting the target size and the target description information into an image generation model that is preset to obtain an image to be edited with the target size output by the image generation model.

- [0141] Step 902: performing a replacement operation on a display area in the image to be edited matching the image to be processed based on the image to be processed, to obtain the target image.
- [0142] In this embodiment, after the user respectively determines the target size and the target description information, an image generation model that is preset may be constrained based on the target size and the target description information to generate the image to be edited with the target size matching the target description information. The target description information may be text information, and the image generation model may be a text-to-image model, which may generate the image to be edited based on the target description information determined by the user. In addition, the generation content of the text-to-image model may also be constrained based on the target size, so that it generates the image to be edited matching the target size.
- [0143] Further, in order to improve the relevance between the target image and the image to be processed, a replacement operation may be performed on a display area in the image to be edited matching the image to be processed based on the image to be processed, to obtain the target image.
- [0144] According to the image processing method provided by this embodiment, the image to be edited is generated based on the target size and the target description information, and the replacement operation is performed on the matching area in the image to be edited by the image to be processed, so that the relevance between the target image and the image to be processed may be improved on the basis of expanding the image to be processed.
- [0145] Fig. 10 is a schematic structural diagram of an image processing apparatus provided by an embodiment of the present disclosure. As shown in Fig. 10, the apparatus includes: a displaying module 1001, a processing module 1002, an acquiring module 1003, and an expansion module 1004. The displaying module 1001 is configured to display, in a content display page, an image to be processed and an image processing control associated with the image to be processed. The processing module 1002 is configured to display an image processing page in response to a trigger operation of a user on the image processing control, where the image processing page includes the image to be processed, a size adjustment control, and a description information determination control. The acquiring module 1003 is configured to acquire a target size determined by the user based on the size adjustment control and target description information determined by the user based on the description information determination control. The expansion module 1004 is configured to perform a size expansion operation on the image to be processed according to the target size and the target description information, to obtain a target image with the target size.
- [0146] Further, based on any of the above embodiments, the displaying module is configured to: display at least one generated image in the content display page, where the at least one generated image is generated based on description information input by the user; determine a target generated image triggered by the user as the image to be processed in response to a trigger operation of the user on the generated image; and display the image to be processed and the image processing control in the content display page.
- [0147] Further, based on any of the above embodiments, the apparatus also includes: a displaying module, configured to display a background canvas of a preset size in a first display area of the image processing page, and display the image to be processed on the background canvas according to a display scale that is preset between the canvas and the image to be processed; and a display module, configured to display the size

adjustment control and the description information determination control in a second display area of the image processing page.

[0148] Further, based on any of the above embodiments, the acquiring module is configured to: determine a current size adjustment type in response to a trigger operation of the user on the size adjustment control; display a size adjustment area corresponding to the size adjustment type; and acquire the target size determined by the user in the size adjustment area.

[0149] Further, based on any of the above embodiments, the size adjustment control includes a first adjustment type control and a second adjustment type control. The acquiring module is configured to: determine, in response to a trigger operation of the user on the first adjustment type control or the second adjustment type control, the first adjustment type control or the second adjustment type control currently triggered by the user as the current size adjustment type. Alternatively, the acquiring module is configured to: display the first adjustment type control and the second adjustment type control that are preset in response to the trigger operation of the user on the size adjustment control; and determine, in response to a trigger operation of the user on the first adjustment type control or the second adjustment type control, the first adjustment type control or the second adjustment type control currently triggered by the user as the current size adjustment type.

[0150] Further, based on any of the above embodiments, the acquiring module is configured to: display a scale adjustment slide bar in the size adjustment area, where the scale adjustment slide bar includes at least one adjustment scale.

[0151] Further, based on any of the above embodiments, the acquiring module is configured to: determine a target adjustment scale determined by the user in response to an adjustment operation of the user on the scale adjustment slide bar; and determine the target size based on the target adjustment scale and an image size corresponding to the image to be processed. Alternatively, the acquiring module is configured to: in response to a drag operation of the user on a size box at an edge of the image to be processed, perform an expansion operation on the size box in scale based on the drag operation; and determine a size of the size box when the drag operation stops, and determine the size of the size box as the target size.

[0152] Further, based on any of the above embodiments, the size adjustment type includes a scale change adjustment type, and the acquiring module is configured to display at least one canvas scale to be selected in the size adjustment area.

[0153] Further, based on any of the above embodiments, the acquiring module is configured to: determine a target canvas scale selected by the user in response to a selection operation of the user on the canvas scale to be selected; and display a background canvas matching the target canvas scale, and display the image to be processed on the background canvas according to a display scale that is preset between the image to be processed and the background canvas.

[0154] Further, based on any of the above embodiments, the acquiring module is configured to: determine a target canvas scale selected by the user in response to a selection operation of the user on the canvas scale to be selected; and determine the target size based on the target canvas scale and a display size of a display interface, so that a length or width of the target image expanded based on the target size is capable of filling the display interface.

- [0155] Further, based on any of the above embodiments, the acquiring module is configured to: display historical description information associated with the image to be processed in the description information determination control; and acquire description information that is edited by the user in response to an edit operation triggered by the user on the historical description information, and determine the description information that is edited as the target description information; and determine the historical description information as the target description information in a case that the user does not perform the edit operation on the historical description information.
- [0156] Further, based on any of the above embodiments, the expansion module is configured to: input the target size and the target description information into an image generation model that is preset to obtain an image to be edited with the target size output by the image generation model; and perform a replacement operation on a display area in the image to be edited matching the image to be processed based on the image to be processed, to obtain the target image.
- [0157] The device provided by this embodiment may be used to implement the technical solutions of the above method embodiments, and the implementation principles and technical effects thereof are similar, which will not be repeated here in this embodiment.
- [0158] In order to implement the above embodiments, an embodiment of the present disclosure also provides a computer-readable storage medium, where computer-executable instructions are stored in the computer-readable storage medium, and when the computer-executable instruction is executed by a processor, the image processing method according to any of the above embodiments is implemented.
- [0159] In order to implement the above embodiments, an embodiment of the present disclosure also provides a computer program product, including a computer program, where when the computer program is executed by a processor, the image processing method according to any of the above embodiments is implemented.
- [0160] In order to implement the above embodiments, an embodiment of the present disclosure also provides an electronic device, including: a processor and a memory;
- [0161] the memory stores computer-executable instructions; and
- [0162] the processor executes the computer-executable instructions stored in the memory, to cause the processor to execute the image processing method according to any of the above embodiments.
- [0163] Fig. 11 is a schematic structural diagram of an electronic device provided by an embodiment of the present disclosure, and the electronic device 1100 may be a terminal device or a server. The terminal device may include, but is not limited to, mobile terminals such as a mobile phone, a notebook computer, a digital broadcast receiver, a personal digital assistant (PDA), a tablet computer, a portable media player (PMP), a vehicle-mounted terminal (e.g., a vehicle-mounted navigation terminal), etc., and stationary terminals such as a digital TV, a desktop computer, etc. The electronic device shown in Fig. 11 is only an example, and should not impose any limitation on the function and scope of use of the embodiments of the present disclosure.
- [0164] As shown in Fig. 11, the electronic device 1100 may include a processing apparatus (such as a central processing unit, a graphics processor, etc.) 1101, which may perform various appropriate actions and processes according to a program stored in a read-only memory (ROM) 1102 or a program loaded from a storage apparatus 1108 into a random access memory (RAM) 1103. The RAM 1103 also stores various programs and

data required for operations of the electronic device 1100. The processing apparatus 1101, the ROM 1102, and the RAM 1103 are connected to each other through a bus 1104. An input/output (I/O) interface 1105 is also connected to the bus 1104.

[0165] Usually, the following apparatuses may be connected to the I/O interface 1105: an input apparatus 1106 including, for example, a touch screen, a touchpad, a keyboard, a mouse, a camera, a microphone, an accelerometer, a gyroscope, etc.; an output apparatus 1107 including, for example, a liquid crystal display (LCD), a speaker, a vibrator, etc.; a storage apparatus 1108 including, for example, a magnetic tape, a hard disk, etc.; and a communication apparatus 1109. The communication apparatus 1109 may allow the electronic device 1100 to perform wireless or wired communication with other devices to exchange data. Although Fig. 11 shows the electronic device 1100 having various apparatuses, it should be understood that it is not required to implement or provide all of the shown apparatuses. More or fewer apparatuses may be implemented or provided alternatively.

[0166] In particular, according to the embodiments of the present disclosure, the process described above with reference to the flowcharts may be implemented as a computer software program. For example, an embodiment of the present disclosure includes a computer program product, which includes a computer program carried on a computer-readable medium, where the computer program contains program codes for performing the method shown in the flowchart. In such an embodiment, the computer program may be downloaded and installed from a network through the communication apparatus 1109, or installed from the storage apparatus 1108, or installed from the ROM 1102. When the computer program is executed by the processing apparatus 1101, the above-mentioned functions defined in the method of the embodiment of the present disclosure are executed.

[0167] It should be noted that the above computer-readable medium in the present disclosure may be a computer-readable signal medium, a computer-readable storage medium, or any combination of the two. The computer-readable storage medium may be, for example, but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus or device, or any suitable combination of the above. More specific examples of the computer-readable storage medium may include, but are not limited to: an electrical connection having one or more wires, a portable computer magnetic disk, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or flash memory), an optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage device, a magnetic storage device, or any suitable combination of the above. In the present disclosure, the computer-readable storage medium may be any tangible medium that contains or stores a program, which may be used by or in combination with an instruction execution system, apparatus, or device. In the present disclosure, the computer-readable signal medium may include a data signal propagated on a baseband or as a part of a carrier wave, and computer-readable program codes are carried therein. This propagated data signal may take many forms, including but not limited to, an electromagnetic signal, an optical signal, or any suitable combination of the above. The computer-readable signal medium may also be any computer-readable medium other than the computer-readable storage medium, and the computer-readable signal medium may send, propagate, or transmit the program used by or in combination with the instruction execution system, apparatus, or device. The program codes contained on the computer-readable medium may be transmitted by any suitable

medium, including but not limited to: a wire, an optical cable, a radio frequency (RF), etc., or any suitable combination of the above.

[0168] The above computer-readable medium may be contained in the above electronic device; or it may exist alone without being assembled into the electronic device.

[0169] The above computer-readable medium carries one or more programs, which, when executed by the electronic device, cause the electronic device to perform the method shown in the above embodiments.

[0170] The computer program codes used to perform the operations of the present disclosure may be written in one or more programming languages or a combination thereof. The above programming languages include object-oriented programming languages such as Java, Smalltalk, C++, and include conventional procedural programming languages such as "C" language or similar programming languages. The program codes may be executed entirely on a user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer, or entirely on the remote computer or server. In the case of involving a remote computer, the remote computer may be connected to the user's computer through any kind of network, including a local area network (LAN) or a wide area network (WAN), or it may be connected to an external computer (for example, connected by using Internet provided by an Internet service provider).

[0171] The flowcharts and block diagrams in the drawings illustrate the possibly implemented architectures, functions, and operations of the system, the method and the computer program product according to various embodiments of the present disclosure. In this regard, each block in the flowchart or block diagram may represent a module, program segment, or part of code, which contains one or more executable instructions for implementing the specified logical functions. It should also be noted that, in some alternative implementations, the functions marked in the blocks may also occur in an order different from that marked in the drawings. For example, two blocks shown in succession may actually be executed substantially in parallel, or they may sometimes be executed in the reverse order, depending on the functions involved. It should also be noted that each block in the block diagram and/or the flowchart, and a combination of the blocks in the block diagram and/or the flowchart may be implemented by a dedicated hardware-based system that executes specified functions or operations, or may be implemented by a combination of dedicated hardware and computer instructions.

[0172] The involved units described in the embodiments of the present disclosure may be implemented by software or by hardware. The name of a unit does not constitute a limitation on the unit under certain circumstances, for example, the first acquiring unit may also be described as "a unit for acquiring at least two internet protocol addresses".

[0173] The functions described above herein may be performed at least in part by one or more hardware logic components. For example, without limitation, exemplary types of hardware logic components that may be used include: a field programmable gate array (FPGA), an application specific integrated circuit (ASIC), an application specific standard product (ASSP), a system-on-chip (SOC), a complex programmable logical device (CPLD) and more.

[0174] In the context of the present disclosure, a machine-readable medium may be a tangible medium that may contain or store a program for use by or in combination with an instruction execution system, apparatus or device. The machine-readable medium may be a machine-readable signal medium or a machine-readable storage medium. The machine-readable medium may include, but is not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semi-conductive system, apparatus, or device, or any suitable combination of the above. More specific examples of the machine-readable storage medium would include an electrical connection based on one or more lines, a portable computer disk, a hard disk, a random access memory (RAM), a read only memory (ROM), an erasable programmable read-only memory (EPROM or flash memory), an optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage device, a magnetic storage device, or any suitable combination of the above.

[0175] The above description is only a preferred embodiment of the present disclosure and an explanation of the applied technical principles. Persons skilled in the art should understand that the scope of disclosure involved in the present disclosure is not limited to the technical solutions formed by the specific combination of the above technical features, and should also cover other technical solutions formed by any combination of the above technical features or their equivalent features without departing from the above concept of disclosure. For example, a technical solution formed by replacing the above features with technical features with similar functions disclosed in the present disclosure (but not limited to).

[0176] In addition, although the various operations are described in a particular order, this should not be understood as requiring the operations to be performed in the particular order shown or in a sequential order. Under certain circumstances, multitasking and parallel processing may be advantageous. Likewise, although the above discussion contains a number of specific implementation details, these should not be interpreted as limiting the scope of the present disclosure. Certain features described in the context of separate embodiments may also be implemented in combination in a single embodiment. Conversely, various features described in the context of a single embodiment may also be implemented in multiple embodiments individually or in any suitable sub-combination.

[0177] Although the subject matter has been described in terms specific to the structural features and/or method logic actions, it should be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or actions described above. Conversely, the specific features and actions described above are merely exemplary forms for implementing the claims.

CLAIMS

1. An image processing method, comprising:
 - displaying, in a content display page, an image to be processed and an image processing control associated with the image to be processed;
 - displaying an image processing page in response to a trigger operation of a user on the image processing control, wherein the image processing page comprises the image to be processed, a size adjustment control, and a description information determination control;
 - acquiring a target size determined by the user based on the size adjustment control and target description information determined by the user based on the description information determination control; and
 - performing a size expansion operation on the image to be processed according to the target size and the target description information, to obtain a target image with the target size.
2. The method of claim 1, wherein displaying, in the content display page, the image to be processed and the image processing control associated with the image to be processed comprises:
 - displaying at least one generated image in the content display page, wherein the at least one generated image is generated based on description information input by the user;
 - determining a target generated image triggered by the user as the image to be processed in response to a trigger operation of the user on the generated image; and
 - displaying the image to be processed and the image processing control in the content display page.
3. The method of claim 1 or 2, further comprising:
 - displaying a background canvas of a preset size in a first display area of the image processing page, and displaying the image to be processed on the background canvas according to a display scale that is preset between the canvas and the image to be processed; and
 - displaying the size adjustment control and the description information determination control in a second display area of the image processing page.
4. The method of any of claims 1-3, wherein acquiring the target size determined by the user based on the size adjustment control comprises:
 - determining a current size adjustment type in response to a trigger operation of the user on the size adjustment control;
 - displaying a size adjustment area corresponding to the size adjustment type; and
 - acquiring the target size determined by the user in the size adjustment area.
5. The method of claim 4, wherein the size adjustment control comprises a first adjustment type control and a second adjustment type control; and

determining the current size adjustment type in response to the trigger operation of the user on the size adjustment control comprises:

determining, in response to a trigger operation of the user on the first adjustment type control or the second adjustment type control, the first adjustment type control or the second adjustment type control currently triggered by the user as the current size adjustment type;

or, determining the current size adjustment type in response to the trigger operation of the user on the size adjustment control comprises:

displaying the first adjustment type control and the second adjustment type control that are preset in response to the trigger operation of the user on the size adjustment control; and

determining, in response to a trigger operation of the user on the first adjustment type control or the second adjustment type control, the first adjustment type control or the second adjustment type control currently triggered by the user as the current size adjustment type.

6. The method of claim 4 or 5, wherein displaying the size adjustment area corresponding to the size adjustment type comprises:

displaying a scale adjustment slide bar in the size adjustment area, wherein the scale adjustment slide bar comprises at least one adjustment scale.

7. The method of claim 6, wherein acquiring the target size determined by the user in the size adjustment area comprises:

determining a target adjustment scale determined by the user in response to an adjustment operation of the user on the scale adjustment slide bar; and

determining the target size based on the target adjustment scale and an image size corresponding to the image to be processed;

or, acquiring the target size determined by the user in the size adjustment area comprises:

in response to a drag-and-drop operation of the user on a size box at an edge of the image to be processed, performing an expansion operation on the size box in equal scale based on the drag-and-drop operation; and

determining a size of the size box in response to the drag-and-drop operation being stopped, and determining the size of the size box as the target size.

8. The method of any of claims 4-7, wherein the size adjustment type comprises a scale change adjustment type, and displaying the size adjustment area corresponding to the size adjustment type comprises:

displaying at least one canvas scale to be selected in the size adjustment area.

9. The method of claim 8, wherein after displaying the size adjustment area corresponding to the size adjustment type, the method further comprises:

determining a target canvas scale selected by the user in response to a selection operation of the user on the canvas scale to be selected; and

displaying a background canvas matching the target canvas scale, and displaying the image to be processed on the background canvas according to a display scale that is preset between the image to be processed and the background canvas.

10. The method of claim 8 or 9, wherein acquiring the target size determined by the user in the size adjustment area comprises:

determining a target canvas scale selected by the user in response to a selection operation of the user on the canvas scale to be selected; and

determining the target size based on the target canvas scale and a display size of a display interface, so that a length or width of the target image expanded based on the target size is capable of filling the display interface.

11. The method of any of claims 1-10, wherein acquiring the target description information determined by the user based on the description information determination control comprises:

displaying historical description information associated with the image to be processed in the description information determination control; and

acquiring description information that is edited by the user in response to an edit operation triggered by the user on the historical description information, and determining the description information that is edited as the target description information; and

determining the historical description information as the target description information in response to the user not performing the edit operation on the historical description information.

12. The method of any of claims 1-11, wherein performing the size expansion operation on the image to be processed according to the target size and the target description information, to obtain the target image with the target size comprises:

inputting the target size and the target description information into an image generation model that is preset to obtain an image to be edited with the target size output by the image generation model; and

performing a replacement operation on a display area in the image to be edited matching the image to be processed based on the image to be processed, to obtain the target image.

13. An image processing apparatus, comprising:

a displaying module, configured to, display, in a content display page, an image to be processed and an image processing control associated with the image to be processed;

a processing module, configured to, display an image processing page in response to a trigger operation of a user on the image processing control, wherein the image processing page comprises the image to be processed, a size adjustment control, and a description information determination control;

an acquiring module, configured to, acquire a target size determined by the user based on the size adjustment control and target description information determined by the user based on the description information determination control; and

an expansion module, configured to, perform a size expansion operation on the image to be processed according to the target size and the target description information, to obtain a target image with the target size.

14. An electronic device, comprising: a processor and a memory;
the memory stores computer-executable instructions; and
the processor executes the computer-executable instructions stored in the memory, to cause the processor to execute the image processing method of any of claims 1-12.

15. A computer-readable storage medium, wherein computer-executable instructions are stored in the computer-readable storage medium, and when the computer-executable instructions are executed by a processor, the image processing method of any of claims 1-12 is implemented.