

# **METHODS AND APPARATUSES FOR FORM OPERATION ON A MOBILE TERMINAL**

## **TECHNICAL FIELD**

[001] The present application relates to mobile terminals, and more particularly, to form operation methods and apparatuses on a mobile terminal.

## **BACKGROUND**

[002] With the rapid development of communication technologies, most mobile phones use touch screens as input devices. Currently, methods for resolving issues of form operations on a mobile terminal in the industry may focus mainly on the following two aspects:

[003] First, a form is submitted through an OK button after the form is filled out. The OK button may locate at the very bottom of the form. A user may need to slide the screen manually to the bottom of the form.

[004] Second, a Submit button may always be hovering around the bottom of the screen. The user may submit an order by directly clicking the hovering button. Although the button is convenient to find, the size of the screen of the mobile terminal may be limited after all. Besides, the hovering Submit button may block part of the content of the form. As a result, the user may still need to scroll down the form.

[005] The existing solutions may utilize clicking a button as the only means of submitting a form. There is a need to find a Submit button by scrolling down to the bottom or at the upper right corner of a title bar. However, operations on a mobile terminal must be as simple as possible and highly fault-tolerant due to limits of the size of the screen and the size of the palm. Therefore, the existing solutions may deteriorate user experience.

## **SUMMARY**

[006] The present application is intended to provide a method and apparatus for form operation on a mobile terminal. When a length of a form exceeds a screen display range of the mobile terminal, a user may do a specific operation through a hand gesture at any position on the screen.

[007] To resolve the above technical issues, in one aspect, the present disclosure is directed to a method for form operation on a mobile terminal. Correspondence between hand gestures, hand-gesture comparison rules, and form operations may be preset. The method may include detecting an input hand gesture on a screen, and acquiring a trajectory of the input hand gesture. The method may also include matching the acquired trajectory of the input hand gesture with the hand gestures in the correspondence in accordance with the hand-gesture comparison rules. The method may further include triggering a corresponding form operation if the matching is successful.

[008] In another aspect, the present disclosure is directed to an apparatus for form operation on a mobile terminal. Correspondence between hand gestures, hand-gesture comparison rules, and form operations may be preset. The apparatus may include a detection module configured to detect an input hand gesture on a screen, and acquire a trajectory of the input hand gesture. The apparatus may also include a matching module configured to match the acquired trajectory of the input hand gesture with the hand gestures in the correspondence in accordance with the hand-gesture comparison rules. The apparatus may further include a form-operation triggering module configured to trigger a corresponding form operation if the acquired trajectory of the input hand gesture matches the hand gestures in the correspondence successfully.

[009] In a further aspect, the present disclosure is directed to a method for submitting a form on a mobile terminal. The method may include detecting an input hand

gesture on a screen, and acquiring a trajectory of the input hand gesture. The method may also include matching the acquired trajectory of the input hand gesture with a preset hand gesture. The method may further include submitting the form if the matching is successful.

[010] In yet another aspect, the present disclosure is directed to an apparatus for submitting a form on a mobile terminal. The apparatus may include a detection module configured to detect an input hand gesture on a screen, and acquire a trajectory of the input hand gesture. The apparatus may also include a matching module configured to match the acquired trajectory of the input hand gesture with a preset hand gesture. The apparatus may further include a form submission module configured to submit the form if the matching is successful.

[011] The embodiments of the present application may have the following results and draw the following distinctions from the existing technologies. When the length of the form may exceed a screen display range of the mobile terminal, there may be no need to scroll down to the bottom to find an operation button. Besides, there may be no need to conduct a clear operation on a hovering operational button. The user may do a specific operation through a hand gesture at any position on the screen. As a result, an individual operational button may be not required while operating the form through hand gestures. The size-limited screen may be completely used for displaying the form content.

[012] In one aspect, if complexity of an input customized hand gesture by the user does not meet a criterion, the embodiments of the present application may include prompting the user to re-input, which may prevent an accidental operation due to an overly simple hand gesture.

[013] In another aspect, if the form is operable after filling in a password, the embodiments of the present application may include performing a password verification by

using a pre-set hand-gesture password, and operating the form accordingly. The original two-step operations may be combined into one.

[014] In a further aspect, the embodiments of the present application may ensure that the hand gesture set by the user is reproducible to avoid a low matching rate of the set hand gesture.

[015] In another further aspect, a hand gesture in a hand-gesture triggering template having a high priority may be firstly matched with the acquired hand gesture, thus accelerating the matching speed.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

[016] **Fig. 1** is a schematic flow chart of an exemplary method for form operation on a mobile terminal, according to an embodiment of the present application.

[017] **Fig. 2** is an exemplary form of a Taobao shopping cart on a mobile terminal, according to an embodiment of the present application.

[018] **Fig. 3** is an exemplary form for adding vehicle information on an inquiry assistant application of regulation violation, according to an embodiment of the present application.

[019] **Fig. 4** is a schematic flow chart of an exemplary method for form operation on a mobile terminal, according to an embodiment of the present application.

[020] **Fig. 5** is a schematic flow chart of an exemplary method for submitting a form on a mobile terminal, according to an embodiment of the present application.

[021] **Figs. 6-8** are snapshots of major pages in an exemplary method for form operation on a mobile terminal, according to an embodiment of the present application.

[022] **Fig. 9** is a schematic structural diagram of an exemplary apparatus for form operation on a mobile terminal, according to an embodiment of the present application.

[023] **Fig. 10** is a schematic structural diagram of an exemplary apparatus for submitting a form on a mobile terminal, according to an embodiment of the present application.

### **DETAILED DESCRIPTION**

[024] In the following descriptions, many technical details are provided for readers to better understand the present application. However, those of ordinary skill in the art may understand that technical solutions claimed in the claims of the present application may still be implemented even without these technical details and various changes and modifications based on the following embodiments.

[025] The embodiments of the present invention will be described below in detail with reference to the accompanying drawings to clarify the objectives, technical solutions, and advantages of the present application.

[026] The first embodiment of the present application relates to a method for form operation on a mobile terminal. **Fig. 1** is a schematic flow chart of an exemplary method for form operation on a mobile terminal, according to an embodiment of the present application.

[027] In some embodiments, the method for form operation on a mobile terminal may include correspondence between hand gestures, hand-gesture comparison rules, and form operations preset therein. As shown in **Fig. 1**, the method may include the following steps.

[028] Step 101: Detect an input hand gesture on a screen, and acquire a trajectory of the input hand gesture.

[029] Step 102: Match the acquired trajectory of the input hand gesture with the hand gestures in the correspondence in accordance with the hand-gesture comparison rules.

[030] Step 103: Trigger a corresponding form operation if the matching is successful.

[031] In some embodiments, the form may be a form of a Taobao shopping cart on the mobile terminal. In some embodiments, the form may be a form for adding vehicle information on an inquiry assistant application of regulation violation. **Fig. 2** is an exemplary form of a Taobao shopping cart on a mobile terminal, according to an embodiment of the present application. **Fig. 3** is an exemplary form for adding vehicle information on an inquiry assistant application of regulation violation, according to an embodiment of the present application. When the form, including car model, query city, license plate number, engine number, vehicle identification number, and note, may be so long that a Submit button may be blocked by a keyboard. When the form may be submitted by using a hand-gesture operation, there is no need to slide to the bottom of the form to find a “Checkout” or “Submit” button.

[032] In some embodiments, the form operation may include submitting the form, deleting an entry in the form, or another relevant operation. A process of form operation may end here.

[033] Accordingly, when the length of the form may exceed a screen display range of the mobile terminal, there may be no need to scroll down to the bottom to find an operation button. Besides, there may be no need to conduct a clear operation on a hovering operational button. The user may do a specific operation through a hand gesture at any position on the screen. As a result, an individual operational button may be not required while operating the form through hand gestures. The size-limited screen may be completely used for displaying the form content.

[034] The second embodiment of the present application relates to another method for form operation on a mobile terminal. The method may include prompting to re-input if

complexity of a customized hand gesture input by the user does not meet a criterion. It may avoid an accidental operation due to an overly simple hand gesture. When a hand gesture is added, the method may include prompting the user to input the hand gesture for multiple times. When the input multiple times of the hand gesture may match with each other, the method may include storing the hand gesture to the correspondence. It may ensure that the hand gesture set by the user is reproducible, and avoid a low matching rate of the hand gesture.

[035] In some embodiments, before step 101, the method may further include prompting the user whether there is a need to add a hand gesture to the correspondence. If the user chooses to add, the method may also include displaying a hand-gesture setting page, detecting an input customized hand gesture on the screen, and setting a corresponding customized hand-gesture comparison rule and a corresponding customized form operation. The method may further include storing the detected customized hand gesture, the customized hand-gesture comparison rule, and the customized form operation in the correspondence.

[036] In some embodiments, if the user chooses not to add a hand gesture, a default hand gesture may be used.

[037] In some embodiments, a customized hand gesture may only be stored in the mobile terminal. When the user gets another mobile terminal, the customized hand gesture needs to be added again. Accordingly, it may bring a high level of security.

[038] In some embodiments, detecting the input customized hand gesture on the screen further of the method may include determining whether complexity of the detected customized hand gesture meets a criterion. If the complexity of the detected customized hand gesture does not meet the criterion, the method may include detecting another input customized hand gesture. The criterion for the complexity of the customized hand gesture

may include whether a number of inflections of a hand-gesture trajectory is within a preset inflection threshold.

[039] The method may avoid an accidental operation due to an overly simple hand gesture by determining whether the complexity of the customized hand gesture meets the criterion.

[040] In some embodiments, the method may include determining whether the complexity meets the criterion that may be set in accordance with another feature, not limited to the number of inflections.

[041] In some embodiments, before storing the detected customized hand gesture, the customized hand-gesture comparison rule, and the customized form operation in the correspondence, the method may further include prompting the user to input multiple times of the customized hand gesture. The method may also include detecting whether the multiple times of the input customized hand gestures match with each other. If there is a match, the method may include storing the detected customized hand gesture into the correspondence.

[042] Only when the input multiple times of the customized hand gesture match with each other, the method may include storing the customized hand gesture into the correspondence. It may ensure that the hand gesture set by the user is reproducible, and avoid a low matching rate of the hand gesture.

[043] In some embodiments, by means of pattern recognition technologies, step 102 of the method may include comparing an irregular pattern, drawn by the user on the screen through a hand gesture, with a locally stored pattern on the mobile terminal. If the comparison is successful, it may indicate that the method includes performing the operation of submitting the current form for one time.

[044] **Fig. 4** is a schematic flow chart of an exemplary method for form operation on a mobile terminal, according to an embodiment of the present application. The method may include the following steps.

[045] In step 401, when the user may enter the form for the first time, the method may include prompting the user to add a hand gesture. If the user chooses to add, the method may also include displaying a hand-gesture setting page, and may enter step 402. If the user chooses not to set, the method may include adopting a default pattern, e.g., “√,” and may enter step 406 to continue filling out the form.

[046] In step 402, the method may include prompting the user to input an account's password to verify the identity of the user.

[047] In step 403, the method may include adding a customized hand gesture. The method may also include ensuring that an added customized hand gesture meets the required complexity of an irregular pattern in accordance with a specified recognition difficulty.

[048] In step 404, the method may include ensuring the customized hand gesture. The method may include prompting the user to input multiple times of the customized hand gesture for confirmation.

[049] In step 405, the customized hand gesture may have been added successfully. From a perspective of security, the method may include storing the customized hand gesture locally in the mobile terminal. When the user may have another mobile terminal, the user may need to add the customized hand gesture again.

[050] In step 406, the method may include continuing to fill out the form.

[051] In step 407, the method may include performing a form operation by the customized hand gesture. When the user draws a previously set customized hand gesture at any position on the screen, the method may include submitting the form.

[052] In some embodiments, when a customized hand gesture may be added, the method may include ensuring that the added customized hand gesture meets the specified complexity to avoid a subsequent accidental operation due to an overly simple hand gesture. In some embodiments, the method may include prompting the user to input multiple times of the customized hand gesture to ensure that the customized hand gesture is reproducible. In some embodiments, the method may include storing the successfully added customized hand gesture locally in the mobile terminal. It may bring a high level of security.

[053] The third embodiment of the present application relates to a method for form operation on a mobile terminal. If the form is operable after filling in a password, the method may include performing a password verification by using a pre-set hand-gesture password, and operating the form accordingly. The original two-step operations may be combined into one. In some embodiments, a hand gesture in a hand-gesture triggering template having a high priority may be firstly matched with the acquired hand gesture, thus accelerating the matching speed.

[054] After storing the detected customized hand gesture, the customized hand-gesture comparison rule, and the customized form operation in the correspondence, the method may further include querying the user whether there is a need to replace an input password by the stored customized hand gesture. If there is a need, the method may include displaying a password-setting page, and storing a set password in the correspondence. In the method, the step of triggering the corresponding form operation if the matching is successful may further include retrieving the stored password from the correspondence, and triggering a password verification operation.

[055] Therefore, the method may include performing a password verification by using a pre-set hand-gesture password, and operating the form accordingly. The original two-step operations may be combined into one.

[056] In some embodiments, the method may not include setting the password as described above.

[057] In some embodiments, the step 102 of the method may include extracting a feature value of the input hand gesture, and comparing the feature value with a feature value of a hand-gesture comparison rule in the correspondence. The step 102 of the method may also include calculating a number of inflections of the input hand gesture, and comparing the inflection data with an inflection threshold of the hand-gesture comparison rule in the correspondence.

[058] In some embodiments, the method may include matching sequentially in accordance with a certain manner. In some embodiments, the correspondence in the method may include at least one set of a hand gesture, a hand-gesture comparison rule, and a corresponding form operation. Each set may constitute a hand-gesture trigger template. In step 102 of the method, matching the acquired trajectory of the input hand gesture with the hand gestures in the correspondence may include matching sequentially in accordance with priorities of hand gesture trigger templates. In other words, the step 102 of the method may include matching the acquired trajectory of the input hand gesture with a hand gesture of a hand-gesture trigger template having a high priority. The priorities of hand-gesture triggering templates may be sorted in accordance with historically cumulative operational numbers of hand gestures in the templates.

[059] In some embodiments, the method may include sorting the matching sequence of the hand-gesture triggering templates in accordance with other manners.

[060] The fourth embodiment of the present application relates to a method for submitting a form on a mobile terminal. **Fig. 5** is a schematic flow chart of an exemplary method for submitting a form on a mobile terminal, according to an embodiment of the present application.

[061] As shown in **Fig. 5**, the method may include the following steps.

[062] Step 501: Detect an input hand gesture on a screen, and acquire a trajectory of the input hand gesture.

[063] Step 502: Match the acquired trajectory of the input hand gesture with a preset hand gesture.

[064] Step 503: Submit the form if the matching is successful.

[065] In some embodiments, before step 501, the method may further include prompting a user whether there is a need to add a preset hand gesture. If the user chooses to add, the method may include displaying a hand-gesture setting page, and detecting an input customized hand gesture on the screen. The method may also include storing the detected customized hand gesture to be the preset hand gesture.

[066] In some embodiments, after storing the detected customized hand gesture to be the preset hand gesture, the method may further include querying the user whether there is a need to replace an input password by the stored customized hand gesture. If there is a need, the method may also include displaying a password-setting page, and storing a set password. In the method, the step of submitting the form if the matching is successful may further include retrieving the stored password, and triggering a password verification operation.

[067] **Figs. 6-8** are snapshots of major pages in an exemplary method for form operation on a mobile terminal, according to an embodiment of the present application. As shown in **Fig. 6**, when the user may enter the for the first time, the method may include

prompting the user that the form may be submitted through a hand gesture. The method may also include prompting the user that a customized hand gesture may be used to submit the form. As shown in **Fig. 7**, after the customized hand gesture is set successfully, the method may include querying the user whether there is a need to replace an input password at this moment. As shown in **Fig. 8**, the user may submit the form by operating the previously set hand gesture at any position on the screen.

[068] The embodiments of the present application may provide the following technical results:

[069] 1. It is only necessary to add a hand gesture for the first time or event unnecessary to add any hand gesture by using a default hand gesture. For subsequent form submissions, the user may only need to operate the added hand gesture at any position on the screen to submit the form.

[070] 2. When the length of the form may exceed the screen display range, there is no need to scroll down to the bottom to find a Submit button. The user may submit the form through a specific hand gesture at any position on the screen.

[071] 3. If a form may be submitted only after filling in a password, the user may pass password verification through a previously set hand gesture password and submitted the form at the same time. The original two-step operations are combined into one.

[072] All method embodiments of the present application may be implemented by means of software, hardware, firmware, or the like. No matter these method embodiments are implemented by means of software, hardware, or firmware, their instruction codes may be stored in any type of computer accessible memory, such as permanent or modifiable, volatile or non-volatile, solid-state or non-solid-state, and fixed or replaceable medium. In some embodiments, their instruction codes may achieve the best results by using Objective C for iOS and Java for Android.

[073] The memory may include, for example, a Programmable Array Logic (PAL), a Random Access Memory (RAM), a Programmable Read Only Memory (PROM), a Read-Only Memory (ROM), an Electrically Erasable Programmable ROM (EEPROM), a magnetic disk, an optical disc, a Digital Versatile Disc (DVD), and so on.

[074] The fifth embodiment of the present application relates to an apparatus for form operation on a mobile terminal. **Fig. 9** is a schematic structural diagram of an exemplary apparatus for form operation on a mobile terminal, according to an embodiment of the present application.

[075] The apparatus for form operation on the mobile terminal may include preset correspondence between hand gestures, hand-gesture comparison rules, and form operations. As shown in **Fig. 9**, the apparatus may include the following modules:

[076] A detection module configured to detect an input hand gesture on a screen, and acquire a trajectory of the input hand gesture.

[077] A matching module configured to match the acquired trajectory of the input hand gesture with the hand gestures in the correspondence in accordance with the hand-gesture comparison rules.

[078] A form-operation triggering module configured to trigger a corresponding form operation if the acquired trajectory of the input hand gesture matches the hand gestures in the correspondence successfully.

[079] The first embodiment above may correspond to this embodiment. This embodiment may be implemented correspondingly with in accordance with the steps of the first embodiment, and vice versa. Related technical details disclosed in the first embodiment may be applicable to this embodiment. Therefore, those technical details may be skipped here to avoid repetition. Similarly, related technical details disclosed in this embodiment may be applicable to the first embodiment.

[080] The sixth embodiment of the present application relates to an apparatus for form operation on a mobile terminal. The apparatus may be configured to prompt the user to re-input if complexity of a customized hand gesture input by the user does not meet a criterion. It may avoid an accidental operation due to an overly simple hand gesture. When a customized hand gesture is added, the apparatus may be configured to prompt the user to input the customized hand gesture for multiple times. When the multiple times of the input customized hand gestures may match with each other, the apparatus may be configured to store the customized hand gesture to the correspondence. It may ensure that the customized hand gesture set by the user is reproducible, and avoid a low matching rate of the hand gesture.

[081] In some embodiments, the apparatus for form operation on the mobile terminal may further include a hand-gesture adding module configured to prompt a user whether there is a need to add a hand gesture to the correspondence.

[082] If the user chooses to add, the hand-gesture adding module may be configured to display a hand-gesture setting page. The detection module may be configured to detect an input customized hand gesture on the screen. The hand-gesture adding module may be further configured to set a corresponding customized hand-gesture comparison rule and a corresponding customized form operation. The hand-gesture adding module may also be configured to store the detected customized hand gesture, the customized hand-gesture comparison rule, and the customized form operation in the correspondence. If the user chooses not to add a customized hand gesture, the apparatus may be configured to use a default hand gesture.

[083] In some embodiments, the apparatus may store the preset hand gesture locally on the mobile terminal. The user may need to add the hand gesture again when the user may get another mobile terminal. It may bring a high level of security. If the user

chooses not to add a customized hand gesture, the apparatus may be configured to use a default hand gesture.

[084] In some embodiments, the hand-gesture adding module may further include a complexity determining sub-module configured to determine whether complexity of the detected customized hand gesture meets a criterion. If the complexity of the detected customized hand gesture does not meet the criterion, the detection module may be further configured to detect another input customized hand gesture. The criterion for the complexity of the customized hand gesture may include whether a number of inflections of a hand-gesture trajectory is within a preset inflection threshold.

[085] In some embodiments, the complexity determining sub-module may be configured to determine whether the complexity meets the criterion that may be set in accordance with another feature, not limited to the number of inflections.

[086] In some embodiments, the hand-gesture adding module may be configured to prompt the user to input multiple times of the set customized hand gesture. The matching module may be configured to detect whether the multiple times of the input customized hand gesture match with each other. If there is a match, the hand-gesture adding module may be configured to store the detected custom gesture in the correspondence.

[087] The second embodiment above may correspond to this embodiment. This embodiment may be implemented in accordance with the steps of the second embodiment, and vice versa. Related technical details disclosed in the second embodiment may be applicable to this embodiment. Therefore, those technical details may be skipped here to avoid repetition. Similarly, related technical details disclosed in this embodiment may be applicable to the second embodiment.

[088] The seventh embodiment of the present invention relates to an apparatus for form operation on a mobile terminal. The seventh embodiment may include certain

improvement on the basis of the sixth embodiment. The major improvements may include the following features. If the form is operable after filling in a password, the method may include performing a password verification by using a pre-set hand-gesture password, and operating the form accordingly. The original two-step operations may be combined into one. In some embodiments, a hand gesture in a hand-gesture triggering template having a high priority may be firstly matched with the acquired hand gesture, thus accelerating the matching speed.

[089] In some embodiments, the apparatus for form operation on the mobile terminal may further include a password adding module configured to query the user whether there is a need to replace an input password by the stored customized hand gesture. If there is a need, the password adding module may be configured to display a password-setting page, and storing a set password in the correspondence. The form-operation triggering module may further include a password verification sub-module configured to retrieve the stored password from the correspondence, and trigger a password verification operation.

[090] In some embodiments, the apparatus of the present application may not be configured to set the password.

[091] In some embodiments, the matching module may include:

[092] A feature matching sub-module configured to extract a feature value of the input hand gesture, and compare the feature value with a feature value of a hand-gesture comparison rule in the correspondence.

[093] An inflection matching sub-module configured to calculate a number of inflections of the input hand gesture, and compare the inflection data with an inflection threshold of the hand-gesture comparison rule in the correspondence.

[094] In some embodiments, the correspondence may include at least one set of a hand gesture, a hand-gesture comparison rule, and a corresponding form operation. Each set may constitute a hand-gesture trigger template. The matching module may be configured to match the acquired trajectory of the input hand gesture with a hand gesture of a hand-gesture trigger template having a high priority in accordance with priorities of hand gesture trigger templates for matching. The priorities of hand-gesture triggering templates may be sorted in accordance with historically cumulative operational numbers of hand gestures in the templates.

[095] In some embodiments, the apparatus may be configured to sort the matching sequence of the hand-gesture triggering templates in accordance with other manners.

[096] The third embodiment above may correspond to this embodiment. This embodiment may be implemented correspondingly with in accordance with the steps of the third embodiment, and vice versa. Related technical details disclosed in the third embodiment may be applicable to this embodiment. Therefore, those technical details may be skipped here to avoid repetition. Similarly, related technical details disclosed in this embodiment may be applicable to the third embodiment.

[097] The eighth embodiment of the present invention relates to an apparatus for submitting a form on a mobile terminal. **Fig. 10** is a schematic structural diagram of an exemplary apparatus for submitting a form on a mobile terminal, according to an embodiment of the present application.

[098] As shown in **Fig. 10**, the apparatus may include:

[099] A detection module configured to detect an input hand gesture on a screen, and acquire a trajectory of the input hand gesture.

[0100] A matching module configured to match the acquired trajectory of the input hand gesture with a preset hand gesture.

[0101] A form submission module configured to submit the form if the matching is successful.

[0102] In some embodiments, the apparatus for submitting the form on the mobile terminal may further include a hand-gesture adding module configured to prompt a user whether there is a need to add a preset hand gesture. If the user chooses to add, the hand-gesture adding module may be configured to display a hand-gesture setting page. The detection module may be configured to detect an input customized hand gesture on the screen. The hand-gesture adding module may also be configured to store the detected customized hand gesture to be the preset hand gesture.

[0103] In some embodiments, the apparatus for submitting the form on the mobile terminal may further include a password setting module configured to query the user whether there is a need to replace an input password by the stored customized hand gesture. If there is a need, the password setting module may also be configured to display a password-setting page, and store a set password. The form submission module may further include a password calling sub-module configured to retrieve the stored password, and trigger a password verification operation.

[0104] The fourth embodiment above may correspond to this embodiment. This embodiment may be implemented correspondingly with in accordance with the steps of the fourth embodiment, and vice versa. Related technical details disclosed in the fourth embodiment may be applicable to this embodiment. Therefore, those technical details may be skipped here to avoid repetition. Similarly, related technical details disclosed in this embodiment may be applicable to the fourth embodiment.

[0105] It should be noted that various modules mentioned in the apparatus embodiments of the present application may be all logic modules. Physically, a logic module may be a physical module, or a part of the physical module. A logic module may be

implemented with a combination of a plurality of physical modules. Physical embodiments of these logic modules may not be the most important, but a combination of functions implemented by these logic modules may be the key to solve the technical issues in the present application. In addition, in order to highlight innovative parts of the present application, the apparatus embodiments of the present application may not include those modules that are not related to the technical issues in the present application. It may not indicate that the apparatus embodiments do not include other modules.

[0106] It should be noted that in the claims and the specification of this application, relational terms herein, such as first and second, may be used merely to distinguish one entity or operation from another entity or operation without requiring or implying any actual such relationship or sequence between these entities or operations. Furthermore, the term “include,” “comprise,” and any other variants thereof are intended to cover non-exclusive inclusion. A process, a method, an article or a device including a series of elements may not only include those elements, but also include other elements not explicitly listed, or may further include inherent elements of the process, the method, the article or the device. In the absence of more limitations, an element as defined by a statement “including a/an...” may be not exclusive of additional identical elements in the process, the method, the article or the device including the element.

[0107] Although the present application has been illustrated and described with reference to some preferred embodiments of the present application, those of ordinary skill in the art should understand that different variations may be made thereto in form and details without departing from the spirit and scope of the present application.

WHAT IS CLAIMED IS:

1. A method for form operation on a mobile terminal, wherein correspondence between hand gestures, hand-gesture comparison rules, and form operations is preset, and the method comprises:

detecting an input hand gesture on a screen, and acquiring a trajectory of the input hand gesture;

matching the acquired trajectory of the input hand gesture with the hand gestures in the correspondence in accordance with the hand-gesture comparison rules; and

triggering a corresponding form operation if the matching is successful.

2. The method for form operation on the mobile terminal according to claim 1, wherein before detecting the input hand gesture on the screen and acquiring the trajectory of the input hand gesture, the method further comprises:

prompting a user whether there is a need to add a hand gesture;

if the user chooses to add, displaying a hand-gesture setting page,

detecting an input customized hand gesture on the screen, and

setting a corresponding hand-gesture comparison rule and a corresponding form operation; and

storing the detected customized hand gesture, the hand-gesture comparison rule, and the form operation in the correspondence.

3. The method for form operation on the mobile terminal according to claim 2, wherein detecting the input customized hand gesture on the screen further includes:

determining whether complexity of the detected customized hand gesture meets a criterion; and

if the complexity of the hand gesture does not meet the criterion, detecting another input customized hand gesture,

wherein the criterion for the complexity of the customized hand gesture includes:

whether a number of inflections of a hand-gesture trajectory is within a preset inflection threshold.

4. The method for form operation on the mobile terminal according to claim 2, wherein after storing the detected customized hand gesture, the hand-gesture comparison rule, and the form operation in the correspondence, the method further comprises:

querying the user whether there is a need to replace an input password by the hand gesture; and

if there is a need, displaying a password-setting page, and storing a set password in the correspondence,

wherein triggering the corresponding form operation if the matching is successful includes retrieving the stored password from the correspondence, and triggering a password verification operation.

5. The method for form operation on the mobile terminal according to claim 2, wherein before storing the detected customized hand gesture, the hand-gesture comparison rule, and the form operation in the correspondence, the method further comprises:

prompting the user to input the customized hand gesture multiple times;

detecting whether the multiple times of the input customized hand gestures match with each other; and

if there is a match, storing the detected customized hand gesture into the correspondence.

6. The method for form operation on the mobile terminal according to claim 1, wherein matching the acquired trajectory of the input hand gesture with the hand gestures in the correspondence in accordance with the hand-gesture comparison rules includes:

extracting a feature value of the input hand gesture, and comparing the feature value with a feature value of a hand-gesture comparison rule in the correspondence; and

calculating a number of inflections of the input hand gesture, and comparing the inflection data with an inflection threshold of the hand-gesture comparison rule in the correspondence.

7. The method for form operation on the mobile terminal according to any of claims 1 to 6, wherein:

the correspondence includes at least one set of a hand gesture, a hand-gesture comparison rule, and a corresponding form operation, each set constituting a hand-gesture trigger template;

matching the acquired trajectory of the input hand gesture with the hand gestures in the correspondence in accordance with the hand-gesture comparison rules includes:

matching the acquired trajectory of the input hand gesture with a hand gesture of a hand-gesture trigger template having a high priority in accordance with priorities of hand gesture trigger templates for matching; and  
the priorities of hand-gesture triggering templates are sorted in accordance with historically cumulative operational numbers of hand gestures in the templates.

8. A method for submitting a form on a mobile terminal, the method comprising:

detecting an input hand gesture on a screen, and acquiring a trajectory of the input hand gesture;

matching the acquired trajectory of the input hand gesture with a preset hand gesture; and

submitting the form if the matching is successful.

9. The method for submitting the form on the mobile terminal according to claim 8, wherein before detecting the input hand gesture on the screen and acquiring the trajectory of the input hand gesture, the method further comprises:

prompting a user whether there is a need to add a preset hand gesture;

if the user chooses to add, displaying a hand-gesture setting page, and detecting an input customized hand gesture on the screen; and

storing the detected customized hand gesture to be the preset hand gesture.

10. The method for submitting the form on the mobile terminal according to claim 9, wherein after storing the detected customized hand gesture to be the preset hand gesture, the method further comprises:

querying the user whether there is a need to replace an input password by the hand gesture; and

if there is a need, displaying a password-setting page, and storing a set password,

wherein submitting the form if the matching is successful further includes retrieving the stored password, and triggering a password verification operation.

11. apparatus for form operation on a mobile terminal, wherein correspondence between hand gestures, hand-gesture comparison rules, and form operations is preset, and

the apparatus comprises:

- a detection module configured to detect an input hand gesture on a screen, and acquire a trajectory of the input hand gesture;

- a matching module configured to match the acquired trajectory of the input hand gesture with the hand gestures in the correspondence in accordance with the hand-gesture comparison rules; and

- a form-operation triggering module configured to trigger a corresponding form operation if the acquired trajectory of the input hand gesture matches the hand gestures in the correspondence successfully.

12. The apparatus for form operation on a mobile terminal according to claim 11, further comprising:

- a hand-gesture adding module configured to:

- prompt a user whether there is a need to add a hand gesture;

- if the user chooses to add, display a hand-gesture setting page, detect an input customized hand gesture on the screen by the detection module, and set a corresponding hand-gesture comparison rule and a corresponding form operation; and

- store the detected customized hand gesture, the hand-gesture comparison rule, and the form operation in the correspondence.

13. The apparatus for form operation on a mobile terminal according to claim 12, wherein the hand-gesture adding module further includes:

- a complexity determining sub-module configured to determine whether complexity of the detected customized hand gesture meets a criterion; and

wherein if the complexity of the hand gesture does not meet the criterion, detect another input customized hand gesture, and

wherein the criterion for the complexity of the customized hand gesture includes whether a number of inflections of a hand-gesture trajectory is within a preset inflection threshold.

14. The apparatus for form operation on a mobile terminal according to claim 12, further comprising;

a password adding module configured to:

query the user whether there is a need to replace an input password by the hand gesture; and

if there is a need, display a password-setting page, and store a set password in the correspondence,

wherein the form-operation triggering module further includes:

a password verification sub-module configured to retrieve the stored password from the correspondence, and trigger a password verification operation.

15. The apparatus for form operation on a mobile terminal according to claim 12, wherein the hand-gesture adding module is further configured to:

prompt the user to input the customized hand gesture multiple times;

detect whether the multiple times of the input customized hand gestures match with each other; and

if there is a match, store the detected customized hand gesture into the correspondence.

16. The apparatus for form operation on a mobile terminal according to claim 11, wherein the matching module includes:

a feature matching sub-module configured to extract a feature value of the input hand gesture, and compare the feature value with a feature value of a hand-gesture comparison rule in the correspondence; and

an inflection matching sub-module configured to calculate a number of inflections of the input hand gesture, and compare the inflection data with an inflection threshold of the hand-gesture comparison rule in the correspondence.

17. The apparatus for form operation on a mobile terminal according to any of claims 11 to 16, wherein:

the correspondence includes at least one set of a hand gesture, a hand-gesture comparison rule, and a corresponding form operation, each set constituting a hand-gesture trigger template;

the matching module is configured to match the acquired trajectory of the input hand gesture with a hand gesture of a hand-gesture trigger template having a high priority in accordance with priorities of hand gesture trigger templates for matching; and

the priorities of hand-gesture triggering templates are sorted in accordance with historically cumulative operational numbers of hand gestures in the templates.

18. An apparatus for submitting a form on a mobile terminal, the apparatus comprising:

a detection module configured to detect an input hand gesture on a screen, and acquire a trajectory of the input hand gesture;

a matching module configured to match the acquired trajectory of the input hand

gesture with a preset hand gesture; and

a form submission module configured to submit the form if the matching is successful.

19. The apparatus for submitting the form on a mobile terminal according to claim 18, further comprising:

a hand-gesture adding module configured to:

prompt a user whether there is a need to add a preset hand gesture;

if the user chooses to add, display a hand-gesture setting page, and detect an input customized hand gesture on the screen; and

store the detected customized hand gesture to be the preset hand gesture.

20. The apparatus for submitting the form on a mobile terminal according to claim 19, further comprising:

a password setting module configured to:

querying the user whether there is a need to replace an input password by the stored customized hand gesture; and

if there is a need, displaying a password-setting page, and storing a set password,

wherein the form submission module further includes:

a password calling sub-module configured to retrieve the stored password, and trigger a password verification operation.