

USER INTERFACE WITH MISTOUCH PREVENTION FOR ELECTRONIC GAMES

FIELD OF THE INVENTION

[0001] The invention pertains to user interfaces, and in particular, graphical user interfaces with mistouch avoidance for electronic games.

BACKGROUND

[0002] Electronic games have generally been played on video game consoles or personal computers using traditional input devices such as gamepads, joysticks, mice, and keyboards. The tactile feedback of the physical controller inputs of these traditional devices allow for a significant degree of control and precision during gameplay. With the proliferation of touchscreen-based electronic devices such as tablets, smartphones, portable media players, touch-enabled laptops, and personal digital assistants (PDAs), users are increasingly playing a variety of electronic games, including strategy-related games, using a touchscreen as the user interface to control the actions of an avatar in the virtual game environment. For example, the touchscreen interface may include one set of touch-sensitive controller inputs configured to enable the user to control the avatar's movement (e.g., forwards, backwards, turning left and right, etc.), and another set of touch-sensitive controller inputs configured to enable the user to execute basic attack actions (e.g., physical attacks) in the game environment.

[0003] In some electronic games, such as multiplayer online battle arena (MOBA) games, the set of touchscreen inputs configured to enable the user to perform basic attack actions may include a first input (or primary attack input) and a second input (or secondary attack input). For example, the first input is configured to execute a basic attack action at any target near the avatar, and the second input (or secondary attack input) is configured to execute a basic attack action at a specific type of computer-controlled target (e.g., tower, minion, etc.) near the avatar.

[0004] The first input may be used more often than the second input and the first input may be represented by a larger graphical element as compared to the graphical element representing the second input. Nevertheless, the first and second inputs are frequently used inputs during gameplay and are typically positioned close to one another to facilitate the user's operation of these controller inputs. For example, the user may switch from repeatedly pressing on the first input to repeatedly pressing on the second input to direct one or more attacks at a specific

enemy that cannot be effectively targeted by pressing the first input. The second input is often used strategically by the user to, for example, continuously direct attacks at a desired target until it is defeated. However, compared to traditional input devices, many users have not been able to achieve the same degree of precision and accuracy of control when using a touchscreen. As a consequence, when the user is repeatedly pressing on the second input, it is easy for the user to accidentally press on an adjacent touchscreen input (e.g., first input) instead, thereby redirecting a subsequent attack action at an unintended target. For example, when the user continuously taps on the second input, it is easy for the user's thumb (or finger) to unintentionally drift away from the second input and lead to mistouch. This may undesirably result in the user being unable to kill off the desired target, thus losing a battle or failing to gain rewards.

[0005] Moreover, the second input is usually represented by a small graphical element on touchscreen interfaces, making it a difficult task for users, who are unable to achieve the same degree of accuracy of control on a touchscreen compared to traditional devices, to avoid mistouch during repeated operations of the second input. This negatively impacts the user's gaming experience. For example, users may be "put off" by the time and effort required to relearn playing using touchscreen inputs.

[0006] What is thus required is a novel user interface which addresses the above problems by conditionally enlarging a selected touchscreen input associated with executing a basic attack action, thus enabling a user to more easily and accurately maintain a continuous operation on the selected touchscreen input when playing an electronic game using a touchscreen device. Furthermore, other desirable features and characteristics will become apparent from the subsequent detailed description and the appended claims, taken in conjunction with the accompanying drawings and this background of the disclosure.

SUMMARY OF INVENTION

[0007] According to a first aspect of the present invention, a method for displaying a user interface in electronic games is described, the method comprising displaying, on a display screen, a primary user input element, the primary user input element configured to shift from a first original configuration to a shrunken configuration, the shrunken configuration occupying a smaller area on the display screen than the first original configuration. The method further comprises displaying, on the display screen, a secondary user input element, the secondary user

input element configured to shift from a second original configuration to an enlarged configuration, the enlarged configuration occupying a larger area on the display screen than the second original configuration, and the first original configuration of the primary user input element occupying a larger area on the display screen than the second original configuration of the secondary user input element. The method further comprises detecting a first user input on the secondary user input element, and in response to detecting the first user input on the secondary user input element, shifting the secondary user input element from the second original configuration to the enlarged configuration, and shifting the primary user input element from the first original configuration to the shrunken configuration. And shifting the secondary user input element from the enlarged configuration back to the second original configuration, and shifting the primary user input element from the shrunken configuration back to the first original configuration only when a second user input is detected on the primary user input element, the second user input being detected subsequent to the first user input.

[0008] Preferably, the step of shifting the secondary user input element from the second original configuration to the enlarged configuration, and the step of shifting the primary user input element from the first original configuration to the shrunken configuration, are invoked simultaneously upon detecting the first user input.

[0009] Preferably, the step of shifting the secondary user input element from the enlarged configuration back to the second original configuration, and the step of shifting the primary user input element from the shrunken configuration back to the first original configuration, are invoked simultaneously upon detecting the second user input.

[0010] Preferably, the shrunken configuration of the primary user input element occupies a larger area on the display screen than the enlarged configuration of the secondary user input element.

[0011] Preferably, the shrunken configuration of the primary user input element occupies a smaller area on the display screen than the enlarged configuration of the secondary user input element.

[0012] Preferably, the secondary user input element in the enlarged configuration extends partially into an area on the display screen that was previously occupied by the primary user input element in the first original configuration.

[0013] Preferably, the second user input is detected after the first user input, and the secondary user input element remains in the enlarged configuration until the second user input is detected.

[0014] Preferably, the method further comprises detecting the second user input on the primary user input element, and in response to detecting the second user input on the primary user input element, shifting the secondary user input element from the enlarged configuration back to the second original configuration, and shifting the primary user input element from the shrunken configuration back to the first original configuration. And detecting a third user input on the primary user input element, the third user input is subsequent to the second user input, and in response to detecting the third user input on the primary user input element, maintaining the secondary user input element in the second original configuration, and maintaining the primary user input element in the first original configuration.

[0015] Preferably, the secondary user input element is a first secondary user input element configured to shift from the second original configuration to a first enlarged configuration, the first secondary user input element is positioned adjacent to a first side of the primary user input element.

[0016] Preferably, the method further comprising displaying, on the display screen, a second secondary user input element positioned adjacent to a second side of the primary user input element, the second secondary user input element configured to shift from a third original configuration to a second enlarged configuration, the second enlarged configuration occupying a larger area on the display screen than the third original configuration, and the first original configuration of the primary user input element occupying a larger area on the display screen than the third original configuration of the second secondary user input element. The method includes detecting the second user input on the primary user input element, and in response to detecting the second user input on the primary user input element, shifting the secondary user input element from the enlarged configuration back to the second original configuration, and shifting the primary user input element from the shrunken configuration back to the first original configuration. And detecting a third user input on the second secondary user input element, the third user input is subsequent to the second user input, and in response to detecting the third user input on the second secondary user input element, shifting the second secondary user input element from the third original configuration to the second enlarged configuration,

and shifting the primary user input element from the first original configuration to the shrunken configuration.

[0017] Preferably, the first secondary user input element is in the second original configuration when the second secondary user input is in the second enlarged configuration.

[0018] Preferably, the method further comprising detecting a fourth user input on the primary user input element, the fourth user input is subsequent to the third user input, and in response to detecting the fourth user input on the primary user input element, shifting the second secondary user input element from the second enlarged configuration back to the third original configuration, and shifting the primary user input element from the shrunken configuration back to the first original configuration.

[0019] Preferably, the method further comprising detecting a fourth user input on the first secondary user input element, the fourth user input is subsequent to the third user input, and in response to detecting the fourth user input on the first secondary user input element, shifting the second secondary user input element from the second enlarged configuration back to the third original configuration, shifting the first secondary user input element from the second original configuration to the first enlarged configuration, and maintaining the primary user input element in the shrunken configuration.

[0020] Preferably, the primary user input element is configured to execute a physical attack action at a human-controlled target or computer-controlled target.

[0021] Preferably, the secondary user input element is configured to execute a physical attack action at a computer-controlled target only.

[0022] Preferably, the first user input and the second user input are touch inputs, and the display screen is a touch sensitive display screen

[0023] According to a second aspect, the present invention provides a system comprising one or more computers and one or more storage devices storing computer-readable instructions that, when executed by the one or more computers, cause the one or more computers to perform all steps of any of the above-described methods. The same applies to one or more non-transitory computer storage media storing instructions that, when executed by one or more computers,

cause the one or more computers to perform any of the above-described methods. The method can thus be easily transferred to other systems and carried out there.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The accompanying figures, where like reference numerals refer to identical or functionally similar elements throughout the separate views and which together with the detailed description below are incorporated in and form part of the specification, serve to illustrate various embodiments, by way of example only, and to explain various principles and advantages in accordance with a present embodiment.

[0025] Figure 1 shows a graphical user interface rendered on a display screen of an electronic device, in accordance with certain embodiments.

[0026] Figures 2a – 2b show a graphical user interface rendered on a display screen of an electronic device, in accordance with certain other embodiments.

[0027] Figures 3a – 3b show a graphical user interface rendered on a display screen of an electronic device, in accordance with certain alternative embodiments.

[0028] Figure 4 is a flowchart showing a method for mistouch avoidance, in accordance with certain embodiments.

[0029] Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been depicted to scale. For example, the dimensions of some of the elements in the block diagrams or steps in the flowcharts may be exaggerated relative to other elements to help improve understanding of the present embodiment.

DETAILED DESCRIPTION

[0030] The following detailed description is merely exemplary in nature and is not intended to limit the invention or the application and uses of the invention. Furthermore, there is no intention to be bound by any theory presented in the preceding background of the invention or the following detailed description.

[0031] It is the intent of certain embodiments to teach a method for avoiding or preventing mistouch in electronic games, the method comprising the step of displaying, on a display screen, a primary user input element configured to shift from a first original configuration to a shrunken

configuration. The shrunken configuration occupies a smaller area on the display screen than the first original configuration. The method further comprises the step of displaying, on the display screen, a secondary user input element configured to shift from a second original configuration to an enlarged configuration. The enlarged configuration occupies a larger area on the display screen than the second original configuration, and the first original configuration of the primary user input element occupies a larger area on the display screen than the second original configuration of the secondary user input element.

[0032] The method further comprises the step of detecting a first user input on the secondary user input element, and in response to detecting the first user input on the secondary user input element, shifting the secondary user input element from the second original configuration to the enlarged configuration, and shifting the primary user input element from the first original configuration to the shrunken configuration. The method further comprises the step of detecting a second user input on the primary user input element, the second user input being detected subsequent to the first user input, and in response to detecting the second user input on the primary user input element, shifting the secondary user input element from the enlarged configuration back to the second original configuration, and shifting the primary user input element from the shrunken configuration back to the first original configuration.

[0033] In some embodiments, the mistouch avoidance method as described herein selectively enlarges the secondary user input element and shrinks the primary user input element in response to a first input, on condition that the secondary user input element is in the second original configuration when the first input is detected on the secondary user input element. The secondary user input element is maintained in the enlarged configuration, and the primary user input element is maintained in the shrunken configuration, as long as another input element (i.e., primary and other secondary input element) is not pressed, which allows the user to easily provide continuous touch inputs (e.g., pressing or tapping) to the enlarged secondary user input element following the first input. The mistouch avoidance method advantageously enlarges the secondary user input element and shrinks the primary user input element to enable the user to continue providing repeated touch inputs on the enlarged secondary user input element more easily and accurately, and concurrently reduces the user's risk of making an unintended touch input on the shrunken primary input element during the time the user is repeatedly tapping on the secondary user input element. For example, the enlargement of the secondary user input

element and shrinking of the primary user input element work in tandem to facilitate the user's continued tapping of the secondary user input element.

[0034] Figure 1 shows a graphical user interface 100 in accordance with certain embodiments. The graphical user interface (hereinafter "interface") 100 corresponds to a game being played on an electronic device. In some embodiments, the interface 100 is rendered on a display screen on the electronic device. In a non-limiting example, the interface 100 is rendered and presented on a touch-sensitive display screen on the electronic device. The display screen may be, for example, a multi-touch sensitive screen capable of sensing and detecting touching (or swiping) operations performed by the user on multiple locations of the screen simultaneously. For example, the user may operate a selectable graphical element of the interface 100 by performing a touching operation on the selectable graphical element. The skilled person would also appreciate that the interface 100 may also be rendered and presented on a traditional non-touch display screen. In such case, traditional input devices including, but not limited to, gamepads, mice, and keyboards may be used to operate the selectable graphical elements of the interface 100. The interface 100 may be rendered on the display screen when a software product corresponding to the game is executed on one or more computing hardware of the electronic device.

[0035] In some embodiments, the game corresponds to a multiplayer online battle arena (MOBA) game, and the game environment rendered on the display screen may be a game level or world associated with MOBA games. For example, the game environment may be displayed from an overhead viewpoint, such as but not limited to a top-down perspective and an isometric perspective. For the purpose of explaining the disclosure, the depicted game viewpoint in Figure 1 corresponds to an overhead viewpoint. The overhead viewpoint is, for example, displaying a user-controlled avatar 152, a first computer controlled target 154, and a second computer-controlled target 156 in the game environment. As the user moves the avatar 152 through the game environment, the display of the game environment may be adjusted to reflect the changes around the user's avatar 152. In some embodiments, the game environment may be displayed on any suitable electronic device that incorporates a multi-touch sensitive display screen, such as but not limited to a smart phone, a tablet computer, a desktop computer, and a laptop computer.

[0036] In some embodiments, the interface 100 includes a plurality of graphical elements configured to provide the user with selectable inputs to play the MOBA game. For example, a

user uses his/her thumbs and/or fingers and selectively performs touching operations on one or more selectable graphical elements of the interface 100. The interface 100 senses the user's touching operations, and the software product corresponding to the game executes a set of machine readable instructions to perform in-game actions pertaining to the selected graphical element(s) of the interface 100.

[0037] In some embodiments, the interface 100 includes a selectable graphical element (hereinafter "directional input element") 110 associated with a set of manipulation inputs for controlling the avatar's 152 movements. For example, the user may perform touching operations on the directional input element 110 and manipulate the directional input element 110 in different directions to move the avatar 152 to different positions in the game environment. The directional input element 110 is, for example, a virtual joystick.

[0038] In some embodiments, the interface 100 includes a first selectable graphical element 120 (hereinafter "primary input element") associated with a set of attack inputs for controlling the avatar's 152 basic attack actions (i.e., physical attack or normal attack). In some embodiments, the primary input element 120 is configured to execute a basic attack action directed at any human-controlled target (not shown) or computer-controlled target near the avatar 152. For example, the user may perform touching operations on the primary input element 120 to execute a basic attack action directed at a computer-controlled tower type target 154, or minion type target 156, near the avatar 152. The primary input element 120 is, for example, a virtual button.

[0039] Although the primary input element 120 is depicted in a rectangle shape configuration, it is appreciated that the primary input element 120 may be configured with any suitable shape. The primary input element 120 may be the most frequently used attack input during gameplay.

[0040] In some embodiments, the interface 100 includes a second selectable graphical element 130 (hereinafter "first secondary input element") associated with the set of attack inputs for controlling the avatar's 152 basic attack actions. In some embodiment, the first secondary input element 130 is configured to execute a basic attack action directed at a specific type of computer-controlled target near the avatar. For example, the user may perform touching operations on the first secondary input element 130 to execute a basic attack action directed at a computer-controlled tower type target 154 near the avatar 152. Configuring the first secondary input element 130 to execute a basic attack action directed at other types of

computer-controlled target is also contemplated. The first secondary input element 130 is, for example, a virtual button.

[0041] In some embodiments, the interface 100 includes a third selectable graphical element 140 (hereinafter “second secondary input element”) associated with the set of attack inputs for controlling the avatar’s 152 basic attack actions. In some embodiments, the second secondary input element 140 is configured to execute a basic attack action directed at a specific type of computer-controlled target near the avatar. The second secondary input element 140 may be configured to direct a basic attack action at a type of computer-controlled target that is different from the first secondary input element 130. For example, the user may perform touching operations on the first secondary input element 130 to execute a basic attack action directed at a computer-controlled minion type target 156 near the avatar 152. The second secondary input element 140 is, for example, a virtual button.

[0042] Although the first and the second secondary input elements (130 and 140) are depicted in a circle shape configuration, it is appreciated that the first and the second secondary input elements (130 and 140) may be configured with any suitable shape. The first and the second secondary input elements (130 and 140) may also be configured in the same or different shape. The first and the second secondary input elements (130 and 140) may be less frequently used attack inputs during gameplay relative to the primary input element 120.

[0043] In some embodiments, the primary input element may be interchangeably presented in a first original-size configuration and a reduced-size configuration during gameplay. The reduced-size configuration, for example, occupies a smaller area on the display screen than the first original-size configuration. The primary input element may be initially presented in the first original-size configuration. In some embodiments, the first secondary input element 130 may be interchangeably presented in a second original-size configuration and a first enlarged-size configuration during gameplay. The first enlarged-size configuration, for example, occupies a larger area on the display screen than the second original-size configuration. The first secondary input element 130 may be initially presented in the second original-size configuration. In some embodiments, the second secondary input element 140 may be interchangeably presented in a third original-size configuration and a second enlarged-size configuration during gameplay. The second enlarged-size configuration, for example, occupies a larger area on the display screen than the third original-size configuration. The second secondary input element 140 may be initially presented in the third original-size configuration.

[0044] In some embodiments, the second original-size configuration of the first secondary input element 130 is same or similar in size as the third original-size configuration of the second secondary input element 140, and the first enlarged-size configuration of the first secondary input element 130 is same or similar in size as the second enlarged-size configuration of the second secondary input element 140. For example, each of the first and second secondary input elements 130 and 140 may be interchangeably presented in a same original-size configuration and a same enlarged-size configuration. Configuring the first and second secondary input elements 130 and 140 with different original-size configurations and different enlarged-size configurations are also contemplated.

[0045] It is contemplated that the user would be operating the primary input element 120 most of the time to execute basic attack actions. It is also contemplated that the user would often intentionally switch (or change) from operating the primary input element 120 to operate the first or the second secondary input elements (130 or 140) to execute basic attack actions directed at a desired computer-controlled target in order to defeat the desired target. As such, the primary input element 120 may be positioned between the first and the second secondary input elements (130 and 140) to facilitate the user's operation of the primary and secondary input elements (120, 130, and 140).

[0046] Figure 1 depicts the configurations of the primary and secondary input elements (120, 130, and 140) prior to detecting any user input on the first or the second secondary input elements (130 or 140). For example, prior to detecting any user input on the interface 100, the primary input element 120 is in the first original-size configuration, the first secondary input element 130 is in the second original-size configuration, and the second secondary input element 140 is in the third original-size configuration.

[0047] In some embodiments, the first original-size configuration of the primary input element 120 occupies a larger area on the display screen than each of the original-size configurations of the first and second secondary input elements 130 and 140. For example, the first original-size configuration of the primary input element 120 may occupy an area that is 1.1 to 2.0 times the area occupied by the second original-size configuration of the first secondary input element 130 or the third original-size configuration of the secondary input element 140. Configuring the first original-size configuration of the primary input element 120 to occupy an area that is more than 2.0 times the area occupied by the second original-size

configuration of the first secondary input element 130, or the third original-size configuration of the secondary input element 140, is also contemplated.

[0048] One or more user inputs may be performed on the primary input element 120 when the primary input element 120 is in the first original-size configuration. For example, prior to performing a user input on the primary input element 120, the first secondary input element 130 is in the second original-size configuration, and the second secondary input element 140 is in the third original-size configuration. Detecting a user input on the primary input element 120 when it is in the first original-size configuration does not invoke any change in the configuration of the primary input elements (120, 130, and 140). For example, in response to detecting the user input on the primary input element 120 when it is in the first original-size configuration, the primary input element 120 is maintained in the first original-size configuration, the first secondary input element 130 is maintained in the second original-size configuration, and the second secondary input element 140 is maintained in the third original-size configuration.

[0049] Figures 2a – 2b show the interface 100 in accordance with certain other embodiments. In particular, Figure 2a depicts the configurations of the primary and secondary input elements (120, 130, and 140) when a user input is detected on the first secondary input element 130, and Figure 2b depicts the configurations of the primary and secondary input elements (120, 130, and 140) when a user input is detected on the second secondary input element 140. In the interest of brevity, elements having the same reference numerals may not be described in detail.

[0050] A first user input (hereinafter “first input”) may be performed on the first secondary input element 130 or the second secondary input element 140 when the primary input element 120 is in the first original-size configuration. In one embodiment, the first input is performed on the first secondary input element 130 when the first secondary input element 130 is in the second original-size configuration and the primary input element 120 is in the first original-size configuration as shown in Figure 1. For example, prior to performing the first input on the first secondary input element 130, the second secondary input element 140 is in the third original-size configuration. In some embodiments, detecting the first input invokes changes in the configurations of the primary input element 120 and the first secondary input element 130. For example, in response to detecting the first input on the first secondary input element 130 when the first secondary input element 130 is in the second original-size configuration and the primary input element 120 is in the first original-size configuration, the first secondary input

element 130 changes (or shifts) to an enlarged-size (or enlarged) configuration 230 and the primary input element 120 changes (or shifts) to a reduced-size (or shrunken) configuration 220 as depicted in Figure 2a. The second secondary input element 140 is, for example, maintained in the third original-size configuration.

[0051] The first secondary input element 230 is maintained in the enlarged-size (or enlarged) configuration, and the primary input element 220 is maintained in the shrunken configuration, when the user continues providing one or more touch inputs on the first secondary input element 230 following the first input. When a touch input is detected on the shrunken primary input element 220, the interface 100 automatically reverts the enlarged first secondary input element 230, and the shrunken primary input element 220, to their respective original-size configurations. For example, the first secondary input element 230 reverts to the second original-size configuration, and the primary input element 220 reverts to the first original-size configuration, when a second user input is detected on the primary input element 220 subsequent to the first input.

[0052] As shown in Figure 2a, the broken line rectangle depicts the area previously occupied by the primary input element 120 in the first original-size configuration; the solid line rectangle depicts the area currently occupied by the primary input element 220 in the reduced-size configuration; the broken line circle depicts the area previously occupied by the first secondary input element 130 in the second original-size configuration; and the solid line circle depicts the area currently occupied by the first secondary input element 230 in the enlarged-size configuration.

[0053] In another embodiment, the first input is performed on the second secondary input element 140 when the second secondary input element 140 is in the third original-size configuration and the primary input element 120 is in the first original-size configuration as shown in Figure 1. For example, prior to performing the first input on the second secondary input element 140, the first secondary input element 130 is in the second original-size configuration. In some embodiments, detecting the first input invokes changes in the configurations of the primary input element 120 and the second secondary input element 140. For example, in response to detecting the first input on the second secondary input element 140 when the second secondary input element 140 is in the third original-size configuration and the primary input element 120 is in the first original-size configuration, the second secondary input element 140 changes (or shifts) to an enlarged-size (or enlarged) configuration 240 and the

primary input element 120 changes (or shifts) to a reduced-size (or shrunken) configuration 220 as depicted in Figure 2b. The first secondary input element 130 is, for example, maintained in the second original-size configuration.

[0054] The second secondary input element 240 is maintained in the enlarged-size (or enlarged) configuration, and the primary input element 220 is maintained in the shrunken configuration, when the user continues providing one or more touch inputs on the second secondary input element 240 following the first input. When a touch input is detected on the shrunken primary input element 220, the interface 100 automatically reverts the enlarged second secondary input element 240, and the shrunken primary input element 220, to their respective original-size configurations. For example, the second secondary input element 240 reverts to the third original-size configuration, and the primary input element 220 reverts to the first original-size configuration, when a second user input is detected on the primary input element 220, subsequent to the first input.

[0055] In some embodiments, a second user input may be detected on the first secondary input element 130 subsequent to the first input. For example, the second user input is detected on the first secondary input element 130 when the first secondary input element 130 is in the third second original-size configuration, the primary input element 220 is in the shrunken configuration, and the second secondary input element 240 is in the enlarged configuration. In this case, as the primary input element 220 is already in the shrunken configuration, the second user input would invoke a change in the configurations of the first secondary input element 130 and the second secondary input element, without invoking any change in the configuration of the primary input element. For example, in response to the detecting the second user input on the first secondary input element 130, the primary input element 220 is maintained in the shrunken configuration, the first secondary input element is shifted to the enlarged configuration, and the second secondary input element reverts to the third original configuration.

[0056] As shown in Figure 2b, the broken line rectangle depicts the area previously occupied by the primary input element 120 in the first original-size configuration; the solid line rectangle depicts the area currently occupied by the primary input element 220 in the reduced-size configuration; the broken line circle depicts the area previously occupied by the second secondary input element 140 in the third original-size configuration; and the solid line circle depicts the area currently occupied by the second secondary input element 240 in the enlarged-size configuration.

[0057] As described in Figures 2a and 2b, the interface 100 shrinks the primary user input to a shrunken configuration 220 and enlarges a selected secondary user input element to an enlarged configuration (230 or 240) on condition that a user input is detected on the selected secondary user input element when the selected secondary user input element is in its original-size configuration (130 or 140). For example, during gameplay, the user may strategically switch from tapping on the primary input element 120 to selectively tap on the first secondary input element 130 (or second secondary input element 140) to execute a basic attack action at a desired target. The interface 100 detects the change in user input and automatically increases the operable area of the selected first secondary input element 130 (or second secondary input element 140) to provide an enlarged first secondary input element 230 (or enlarged second secondary input element 240), and at the same time automatically reduces the operable area of the primary input element 120 to provide a shrunken primary input element 220. The enlarged secondary user input element (230 or 240) is maintained in the enlarged configuration, and the shrunken primary input element is maintained in the shrunken configuration, as long as the user continues to tap on the enlarged secondary user input element.

[0058] The interface 100 as described herein advantageously enlarges the selected secondary user input element (130 or 140) and shrinks the primary user input element (120) to enable the user to continue providing one or more touch inputs on the selected secondary user input element (230 or 240) more easily and accurately, and concurrently reduces the user's risk of making an unintended touch input on the primary user input element. For example, it is much easier for the user to continue tapping on the selected secondary user input element when it is enlarged, and shrinking the primary user input element makes it less likely for the user to accidentally touch the primary user input element during the time the user is repeatedly tapping on the secondary user input element. This is beneficial because the enlargement of the selected secondary user input element and shrinking of the primary user input element work in tandem to facilitate the user's continued tapping of the selected secondary user input element to execute a string of basic attack actions at a desired target until the desired target is defeated, thereby gaining a strategic victory or winning rewards.

[0059] In some embodiments, the enlarged first secondary input element 230 occupies a smaller area than the shrunken primary input element 220; and the enlarged second secondary input element 240 occupies a smaller area than the shrunken primary input element 220. In some embodiments, the enlarged first secondary input elements 230 is spaced apart from the

area previously occupied by the original-size primary input element 120 as depicted in Figure 2a; and the enlarged second secondary input element 240 is spaced apart from the area previously occupied by the original-size primary input element 120 as depicted in Figure 2b. This configuration of the interface 100 results in the advantages described above while still enabling the user to switch from operating the enlarged first secondary input element 230 (or the enlarged second secondary input element 240) back to operating the primary input element 220 with relative ease and accuracy.

[0060] In some alternative embodiments, the enlarged first secondary input element 330 occupies a larger area than the shrunken primary input element 320; and the enlarged second secondary input element 340 occupies a larger area than the shrunken primary input element 320. In some embodiments, the enlarged first secondary input element 330 extends partially into the area previously occupied by the original-size primary input element 120 as depicted in Figure 3a; and the enlarged second secondary input elements 340 extends partially into the area previously occupied by the original-size primary input element 120 as depicted in Figure 3b. This configuration of the interface 100, as shown in Figures 3a and 3b, results in the advantages as described in connection with increasing the operable area of the first secondary input element 130 (or second secondary input element 140) and reducing the operable area of the primary input element 120. For example, the enlarged first secondary input element 330 shown in Figure 3a occupies a larger area than the enlarged first secondary input element 230 shown in Figure 2a; and the enlarged second secondary input element 340 shown in Figure 3b occupies a larger area than the enlarged second secondary input element 240 shown in Figure 2b, thus the user is able to continuously operate the first secondary input element 330 (or the second secondary input element 340) with greater ease and accuracy. Moreover, configuring the first secondary input element 330 to extend partially into the area previously occupied by the original-size primary input element 120; and configuring the enlarged second secondary input elements 340 to extend partially into the area previously occupied by the original-size primary input element 120 beneficially maximizes the utilization of the display screen.

[0061] In Figure 4, there is shown a flowchart describing a method for displaying a user interface in an electronic game, in accordance with certain embodiments. The method is explained in conjunction with the interface 100 as described earlier through the previous figures of the disclosure and same or similar processes and elements may not be described in detail. The steps identified in Figure 4 are exemplary and may include various alternatives, equivalents,

or derivations thereof including but not limited to the order of execution of the same. The steps of Figure 4 (and its various alternatives) may be embodied in hardware or software including a computer-readable storage medium including instructions executable by the likes of a processor in a computing device. The exemplary method may be performed repeatedly during game play.

[0062] In step 402, the method executes a software product on the computing hardware of an electronic device. In a non-limiting example, the electronic device can be any appropriate device incorporating a multi-touch sensitive display screen, examples of which have been set forth earlier. Alternatively, the electronic device may also incorporate a traditional non-touch display screen. The software corresponds to a video game system, for facilitating playing of a game on the electronic device.

[0063] In step 404, as the software product is executed, the method includes generating and rendering on a graphical user interface a representation of the game environment on the display screen of the electronic device. In some embodiments, the game environment may be a game level or world associated with MOBA games. For example, the game environment may be displayed from an overhead viewpoint, such as but not limited to a top-down perspective and an isometric perspective.

[0064] In some embodiments, the method includes presenting via the graphical user interface the first secondary input element 130, the second secondary input element 140, and the primary input element 120 positioned between the first and the second secondary input elements (130 and 140). The primary input element 120 is presented in a first original configuration, and configured to shift from the first original configuration to a shrunken configuration, whereby the shrunken configuration occupies a smaller area on the display screen than the first original configuration. The first secondary input element 130 is presented in a second original configuration, and configured to shift from the second original configuration to a first enlarged configuration, whereby the first enlarged configuration occupies a larger area on the display screen than the second original configuration. The first original configuration of the primary input element 120, for example, occupies a larger area on the display screen than the second original configuration of the first secondary input element 130. The second secondary input element 140 is presented in a third original configuration, and configured to shift from the third original configuration to a second enlarged configuration, whereby the second enlarged configuration occupies a larger area on the display screen than the third original configuration.

The first original configuration of the primary user input element 120, for example, occupies a larger area on the display screen than the third original configuration of the second secondary user input element 140.

[0065] In some embodiments, the method continues to step 406 if a user input is detected on the first secondary input element 130 on the graphical user interface. In other embodiments, the method skips steps 406 and 408 to proceed directly to step 410 if a user input is detected on the second secondary input element 140 on the graphical user interface. In further embodiments, the method skips steps 406, 408, 410, and 412 to proceed directly to step 414 if a user input is detected on the primary input element 120.

[0066] In step 406, the method includes detecting a first user input on the first secondary input element 130 when the first secondary input element 130 is in the second original configuration and the primary input element 120 is in the first original configuration. The method continues to step 408 if the first user input is detected on the first secondary input element 130.

[0067] Proceeding further to step 408, in response to detecting the first user input on the first secondary input element 130, the method includes shifting the first secondary input element 130 from the second original configuration to the first enlarged configuration, and shifting the primary input element 120 from the first original configuration to the shrunken configuration. In some embodiments, the method simultaneously invokes both the step of shifting the first secondary input element 130 from the second original configuration to the first enlarged configuration, and the step of shifting the primary input element 120 from the first original configuration to the shrunken configuration. The second secondary input element is, for example, maintained in the third original configuration

[0068] In some embodiments, the method continues to step 410 if a user input is detected on the second secondary input element 140 on the graphical user interface. In other embodiments, the method returns to step 406 if another user input is detected on the enlarged first secondary input element on the graphical user interface. For example, if a user input is detected on the enlarged first secondary input element, the first secondary input element is maintained in the first enlarged configuration and the primary input element is maintained in the shrunken configuration. In further embodiments, the method skips steps 410 and 412 to proceed directly to step 414 if a user input is detected on the shrunken primary input element.

[0069] In step 410, the method includes detecting a second user input on the second secondary input element 140 when the second secondary input element 140 is in the third original configuration, the first secondary input element is in the first enlarged configuration, and the primary input element is in the shrunk configuration. For example, the second user input is detected subsequent to the first user input. The method continues to step 412 if the second user input is detected on the second secondary input element 140.

[0070] Proceeding further to step 412, in response to detecting the second user input on the second secondary input element 140, the method includes shifting the second secondary input element 140 from the third original configuration to the second enlarged configuration, and shifting the first secondary input element from the first enlarged configuration back to the second original configuration. The primary input element is, for example, maintained in the shrunk configuration. In this case, the primary input element is in the shrunk configuration, the first secondary input element is in the first enlarged configuration, and the second secondary input element is in the third original configuration following step 408. Therefore, in step 412, the method invokes changes to the configurations of the enlarged-size first secondary input element and the original-size second secondary input element, but does not invoke a change to the configuration of the shrunk primary input element. For example, in response to detecting the second user input on the second secondary input element 140, the method includes maintaining the primary input element in the shrunk configuration so as to display the second secondary input element in the second enlarged configuration, the primary input element in the shrunk configuration, and the first secondary input element 130 in the second original configuration.

[0071] In some embodiments, the method continues to step 414 if a user input is detected on the primary input element on the graphical user interface. In other embodiments, the method returns to step 410 if another user input is detected on the enlarged second secondary input element on the graphical user interface. For example, if a user input is detected on the enlarged second secondary input element, the second secondary input element is maintained in the second enlarged configuration and the primary input element is maintained in the shrunk configuration. In further embodiments, the method returns to step 406 if a user input is detected on the first secondary input element 130 on the graphical user interface.

[0072] In step 414, the method includes detecting a third user input on the primary input element when the primary input element is in the shrunk configuration and the second

secondary input element is in the second enlarged configuration. For example, the third user input is detected subsequent to the second user input. The method returns to step 404 if the third user input is detected on the shrunken primary input element.

[0073] Proceeding to step 404, in response to detecting the third user input on the primary input element, the method includes shifting the second secondary input element from the second enlarged configuration back to the third original configuration, and shifting the primary input element from the shrunken configuration back to the first original configuration. The first secondary input element is, for example, maintained in the second original configuration. In this case, the primary input element is in the shrunken configuration, the first secondary input element is in the second original configuration, and the second secondary input element is in the second enlarged configuration following step 412. Therefore, in step 404, the method invokes changes to the configurations of the reduced-size primary input element and the enlarged-size second secondary input element, but does not invoke a change to the configuration of the original-size first secondary input element 130. For example, in response to detecting the third user input on the shrunken primary input element, the method includes maintaining the first secondary input element in the second original configuration 130 so as to display the primary input element in the first original configuration 120, the first secondary input element in the second original configuration 130, and the second secondary input element in the third original configuration 140. In some embodiments, the method simultaneously invokes both the step of shifting the second secondary input element from the second enlarged configuration back to the third original configuration, and the step of shifting the primary input element from the shrunken configuration back to the first original configuration.

[0074] Therefore, the method as described in Figure 4 advantageously allows the primary input element to have a bigger size under default circumstances during gameplay, and a smaller size during specific scenarios when the user selectively presses (or taps) on the first or the second secondary input element. Reducing the size of the primary input element reduces the likelihood of the user accidentally pressing the primary input element. Moreover, the selected first (or second) secondary input element remains in the enlarged size as long as the user continues to press or tap the selected first (or second) secondary input element. Enlarging the selected first (or second) secondary input element advantageously facilitates the user's continued operation of the selected first (or second) secondary input element, and further reduces the likelihood of the user accidentally pressing the primary input element.

[0075] The present invention may be implemented in a game that may be operable using a variety of devices or game systems. For example, a device may be a personal computer, a home entertainment system, a portable gaming device, or a mobile computing device. The present methodologies described herein are fully intended to be operable on a variety of devices or game systems. Any hardware platform suitable for performing the methodologies described here is suitable for use with the invention. Computer-readable storage media refer to any medium or media that participate in providing instructions to a CPU for execution. Such media can take many forms, such as but not limited to, non-volatile and volatile media including optical or magnetic disks and dynamic memory, respectively. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, a hard disk, magnetic tape, any other magnetic medium, a CD- ROM disk, digital video disk (DVD), any other optical medium, RAM, PROM, EPROM, a FLASH-EPROM, any other memory chip or cartridge.

[0076] Various forms of transmission media may be involved in carrying one or more sequences of one or more instructions to a CPU for execution. A bus carries the data to system RAM, from which a CPU retrieves and executes the instructions. The instructions received by system RAM can optionally be stored on a fixed disk either before or after execution by a CPU.

[0077] Unless specifically stated otherwise, and as apparent from the following, it will be appreciated that throughout the present specification, discussions utilizing terms such as "receiving", "identifying", "initiating", "tagging", "transmitting", "running", "incrementing", "determining", "assigning", "approving", "selecting", "sending", "calculating", "determining", "replacing", "generating", "initializing", "outputting", or the like, refer to the action and processes of a computer system, or similar electronic device, that manipulates and transforms data represented as physical quantities within the computer system into other data similarly represented as physical quantities within the computer system or other information storage, transmission or display devices.

[0078] In the application, unless specified otherwise, the terms "comprising", "comprise", and grammatical variants thereof, intended to represent "open" or "inclusive" language such that they include recited elements but also permit inclusion of additional, non-explicitly recited elements.

[0079] It will be apparent that various other modifications and adaptations of the application will be apparent to the person skilled in the art after reading the foregoing disclosure without

departing from the spirit and scope of the application and it is intended that all such modifications and adaptations come within the scope of the appended claims.

CLAIMS

1. A method for displaying a user interface in electronic games, the method comprising:
displaying, on a display screen, a primary user input element, the primary user input element configured to shift from a first original configuration to a shrunken configuration, the shrunken configuration occupying a smaller area on the display screen than the first original configuration;
displaying, on the display screen, a secondary user input element, the secondary user input element configured to shift from a second original configuration to an enlarged configuration, the enlarged configuration occupying a larger area on the display screen than the second original configuration, and the first original configuration of the primary user input element occupying a larger area on the display screen than the second original configuration of the secondary user input element;
detecting a first user input on the secondary user input element, and in response to detecting the first user input on the secondary user input element, shifting the secondary user input element from the second original configuration to the enlarged configuration, and shifting the primary user input element from the first original configuration to the shrunken configuration; and
shifting the secondary user input element from the enlarged configuration back to the second original configuration, and shifting the primary user input element from the shrunken configuration back to the first original configuration only when a second user input is detected on the primary user input element, the second user input being detected subsequent to the first user input.
2. The method of claim 1, wherein the step of shifting the secondary user input element from the second original configuration to the enlarged configuration, and the step of shifting the primary user input element from the first original configuration to the shrunken configuration, are invoked simultaneously upon detecting the first user input.
3. The method of claim 1 or 2, wherein the step of shifting the secondary user input element from the enlarged configuration back to the second original configuration, and the step of shifting the primary user input element from the shrunken configuration back to the first original configuration, are invoked simultaneously upon detecting the second user input.

4. The method of any one of claims 1 – 3, wherein the shrunken configuration of the primary user input element occupies a larger area on the display screen than the enlarged configuration of the secondary user input element.
5. The method of any one of claims 1 – 3, wherein the shrunken configuration of the primary user input element occupies a smaller area on the display screen than the enlarged configuration of the secondary user input element.
6. The method of claim 5, wherein the secondary user input element in the enlarged configuration extends partially into an area on the display screen that was previously occupied by the primary user input element in the first original configuration.
7. The method of any one of claims 1 – 6, wherein the second user input is detected after the first user input, and the secondary user input element remains in the enlarged configuration until the second user input is detected.
8. The method of any one of claims 1 – 7, further comprising:
 - detecting the second user input on the primary user input element, and in response to detecting the second user input on the primary user input element, shifting the secondary user input element from the enlarged configuration back to the second original configuration, and shifting the primary user input element from the shrunken configuration back to the first original configuration; and
 - detecting a third user input on the primary user input element, the third user input is subsequent to the second user input, and in response to detecting the third user input on the primary user input element, maintaining the secondary user input element in the second original configuration, and maintaining the primary user input element in the first original configuration.
9. The method of any one of claims 1 – 7, wherein the secondary user input element is a first secondary user input element configured to shift from the second original configuration to a first enlarged configuration, the first secondary user input element is positioned adjacent to a first side of the primary user input element.
10. The method of claim 9, further comprising:

displaying, on the display screen, a second secondary user input element positioned adjacent to a second side of the primary user input element, the second secondary user input element configured to shift from a third original configuration to a second enlarged configuration, the second enlarged configuration occupying a larger area on the display screen than the third original configuration, and the first original configuration of the primary user input element occupying a larger area on the display screen than the third original configuration of the second secondary user input element;

detecting the second user input on the primary user input element, and in response to detecting the second user input on the primary user input element, shifting the secondary user input element from the enlarged configuration back to the second original configuration, and shifting the primary user input element from the shrunken configuration back to the first original configuration; and

detecting a third user input on the second secondary user input element, the third user input is subsequent to the second user input, and in response to detecting the third user input on the second secondary user input element, shifting the second secondary user input element from the third original configuration to the second enlarged configuration, and shifting the primary user input element from the first original configuration to the shrunken configuration.

11. The method of claim 10, wherein the first secondary user input element is in the second original configuration when the second secondary user input is in the second enlarged configuration.

12. The method of claim 10 or 11, further comprising:

detecting a fourth user input on the primary user input element, the fourth user input is subsequent to the third user input, and in response to detecting the fourth user input on the primary user input element, shifting the second secondary user input element from the second enlarged configuration back to the third original configuration, and shifting the primary user input element from the shrunken configuration back to the first original configuration.

13. The method of claim 10 or 11, further comprising:

detecting a fourth user input on the first secondary user input element, the fourth user input is subsequent to the third user input, and in response to detecting the fourth user input on the first secondary user input element,

shifting the second secondary user input element from the second enlarged configuration back to the third original configuration,

shifting the first secondary user input element from the second original configuration to the first enlarged configuration, and

maintaining the primary user input element in the shrunken configuration.

14. The method of any one of claims 1 – 13, wherein the primary user input element is configured to execute a physical attack action at a human-controlled target or computer-controlled target.

15. The method of any one of claims 1 – 14, wherein the secondary user input element is configured to execute a physical attack action at a computer-controlled target only.

16. The method of any one of claims 1 – 15, wherein the first user input and the second user input are touch inputs, and the display screen is a touch sensitive display screen.

17. A system comprising one or more computers and one or more storage devices storing computer-readable instructions that, when executed by the one or more computers, cause the one or more computers to perform one or more operations according to the method of any one of claims 1 to 16.

18. One or more non-transitory computer storage media storing instructions that, when executed by one or more computers, cause the one or more computers to perform one or more operations according to the method of any one of claims 1 to 16.