touch screen displays more frequently. In many cases, these displays may be the primary interface for user input.

During certain operating conditions, the ability of an operator to manipulate user input devices such as keys, keyboards, a mouse, or other input devices may become more difficult than desired. For example, some input devices may be more difficult than desired to use during certain maneuvers of the aircraft such as takeoff and landing. In another example, other conditions such as the weather also may make the use of input devices more difficult. Therefore, it would be desirable to have a method and apparatus that takes into account at least some of the issues discussed above, as well as other possible issues.

SUMMARY

In one illustrative embodiment, an apparatus comprises a touch screen system, an acceleration detector located within the touch screen system, and an input manager in communication with the acceleration detector. The touch screen system is configured to display a graphical user interface and receive user input for controlling operation of an aircraft. The acceleration detector is configured to detect acceleration of the touch screen system. The input manager is configured to initiate an action when the acceleration of the touch screen system reduces usability of the touch screen system. The acceleration reduces the usability of the touch screen system when the acceleration of the touch screen system has a magnitude that is greater than a selected threshold. The selected threshold is based on a graphical user interface displayed on the touch screen system.

In another illustrative embodiment, a method for managing a touch screen system is present. Data generated by an acceleration detector about acceleration of the touch screen system is received. The acceleration detector is located within the touch screen system. The touch screen system is configured to display a graphical user interface and receive user input for controlling operation of an aircraft. An action is initiated by an input manager when the acceleration of the touch screen system reduces usability of the touch screen system. The acceleration reduces the usability of the touch screen system when the acceleration of the touch screen system has a magnitude that is greater than a selected threshold. The selected threshold is based on the graphical user interface displayed on the touch screen system.

In another illustrative embodiment, an aircraft control system comprises a network in an aircraft, data processing systems in the aircraft, a touch screen system, an acceleration detector, and an input manager. The data processing systems are connected to the network and are configured to control operation of the aircraft. The touch screen system is configured to display a graphical user interface with a number of controls configured to receive user input for the data processing systems to control the operation of the aircraft. The acceleration detector is located within the touch screen system. The acceleration detector is configured to detect acceleration of the touch screen system. The input manager in communication with the acceleration detector. The input manger is configured to initiate an action when the acceleration of the touch

screen system reduces usability of the number of controls displayed in the graphical user interface on the touch screen system. The acceleration reduces the usability of the touch screen system when the acceleration of the touch screen system has a magnitude that is greater than a selected threshold. The selected threshold is based on the graphical user interface displayed on the touch screen system.

The features and functions can be achieved independently in various embodiments of the present disclosure or may be combined in yet other embodiments in which further details can be seen with reference to the following description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the illustrative embodiments are set forth in the appended claims. The illustrative embodiments, however, as well as a preferred mode of use, further objectives and features thereof, will best be understood by reference to the following detailed description of an illustrative embodiment of the present disclosure when read in conjunction with the accompanying drawings, wherein:

Figure 1 is an illustration of an aircraft in accordance with an illustrative embodiment;

Figure 2 is an illustration of a block diagram of an information processing environment in accordance with an illustrative embodiment;

Figure 3 is an illustration of a block diagram of a touch screen system in accordance with an illustrative embodiment;

Figure 4 is an illustration of a graphical user interface in accordance with an illustrative embodiment;

Figure 5 is another illustration of a graphical user interface with a change in controls in accordance with an illustrative embodiment;

Figure 6 is an illustration of a disabled graphical user interface in accordance with an illustrative embodiment;

Figure 7 is an illustration of a flowchart of a process for managing a touch screen system in accordance with an illustrative embodiment; and

Figure 8 is an illustration of a block diagram of a data processing system in accordance with an illustrative embodiment.

DETAILED DESCRIPTION

The illustrative embodiments recognize and take into account one or more different considerations. For example, the illustrative embodiments recognize and take into account that touch screen systems may further reduce the amount of space needed in a cockpit for different functions. With a touch screen system, input may be generated

CLAIMS

1. An apparatus comprising:

a touch screen system configured to display a graphical user interface and receive user input for controlling operation of an aircraft;

an acceleration detector located within the touch screen system, wherein the acceleration detector is configured to detect acceleration of the touch screen system; and

an input manager in communication with the acceleration detector and configured to initiate an action when the acceleration of the touch screen system reduces usability of the touch screen system,

wherein the acceleration reduces the usability of the touch screen system when the acceleration of the touch screen system has a magnitude that is greater than a selected threshold; and

wherein the selected threshold is based on the graphical user interface displayed on the touch screen system.

2. The apparatus of claim 1, wherein the acceleration detector is configured to generate data about the acceleration of the touch screen system and the input manager is configured to receive data from the acceleration detector and determine when the acceleration of the touch screen system reduces the usability of the touch screen system using the data.

~~3. The apparatus of claim 1, wherein the acceleration reduces the usability of the touch screen system when the acceleration of the touch screen system has a magnitude that is greater than a selected threshold.~~

~~4. The apparatus of claim 3, wherein the selected threshold is based on a graphical user interface displayed on the touch screen system.~~

~~5~~3. The apparatus of claim 1, wherein the action is selected from at least one of disabling the touch screen system, generating an alert, and requesting confirmation of an input made to the touch screen system.

~~6~~4. The apparatus of claim 1, wherein the action is a first action and wherein the input manager is

configured to initiate a second action when the acceleration of the touch screen system no longer reduces the usability of the touch screen system.

~~7~~5. The apparatus of claim ~~6~~4, wherein the second action is selected from at least one of enabling the touch screen system, increasing a functionality of a graphical user interface to an original level, and returning a size of a number of controls in the graphical user interface to an original size.

~~8~~6. The apparatus of claim 1, wherein the input manager is configured to determine a level of reduced usability of the touch screen system and initiate the action based on the level of reduced usability of the touch screen system.

~~9~~7. The apparatus of claim 1, wherein the acceleration is caused by vibrations caused by the operation of the aircraft.

~~10~~8. The apparatus of claim 1, wherein the touch screen system is selected from one of a flight management system and an autopilot.

~~11~~9. A method for managing a touch screen system, the method comprising:

receiving data generated by an acceleration detector about acceleration of the touch screen system, wherein the acceleration detector is located within the touch screen system and the touch screen system is configured to display a graphical user interface and receive user input for controlling operation of an aircraft; and

initiating, by an input manager, an action when the acceleration of the touch screen system reduces usability of the touch screen system,

wherein the acceleration reduces the usability of the touch screen system when the acceleration of the touch screen system has a magnitude that is greater than a selected threshold; and

wherein the selected threshold is based on the graphical user interface displayed on the touch screen system.

~~12~~10. The method of claim ~~11~~ 9 further comprising:

determining, by the input manager, when the acceleration of the touch screen system reduces the usability of the touch screen system using the data.

~~13. The method of claim 11, wherein the acceleration reduces the usability of the touch screen system when the acceleration of the touch screen system has a magnitude that is greater than a selected threshold.~~

~~14. The method of claim 13, wherein the selected threshold is based on a graphical user interface displayed on the touch screen system.~~

~~15~~11. The method of claim ~~11~~9, wherein the action is selected from at least one of disabling the touch screen system, generating an alert, and requesting confirmation of an input made to the touch screen system.

~~16~~12. The method of claim ~~11~~9, wherein the action is a first action and wherein the input manager is configured to initiate a second action when the acceleration of the touch screen system no longer reduces the usability of the touch screen system.

~~17~~13. The method of claim ~~16~~12, wherein the second action is selected from at least one of enabling the touch screen system, increasing a functionality of a graphical user interface to an original level, and returning a size of controls in the graphical user interface to an original size.

~~18~~14. The method of claim ~~11~~9, wherein the acceleration detector is an accelerometer system.

~~19~~15. The method of claim ~~11~~9, wherein the acceleration is caused by at least one of vibrations caused by the operation of the aircraft, the aircraft in turbulence, landing of the aircraft, and takeoff of the aircraft.

~~20~~16. An aircraft control system comprising:

a network in an aircraft;

data processing systems in the aircraft, wherein the data processing systems are connected to the network and are configured to control operation of the aircraft;

a touch screen system configured to display a graphical user interface with a number of controls configured to receive user input for the data processing systems to control the operation of the aircraft;

an acceleration detector located within the touch screen system, wherein the acceleration detector is configured to detect acceleration of the touch screen system; and

an input manager in communication with the acceleration detector and configured to initiate an action when the acceleration of the touch screen system reduces usability of the number of controls displayed in the graphical user interface on the touch screen system,

wherein the acceleration reduces the usability of the touch screen system when the acceleration of the touch screen system has a magnitude that is greater than a selected threshold; and

wherein the selected threshold is based on the graphical user interface displayed on the touch screen system.