



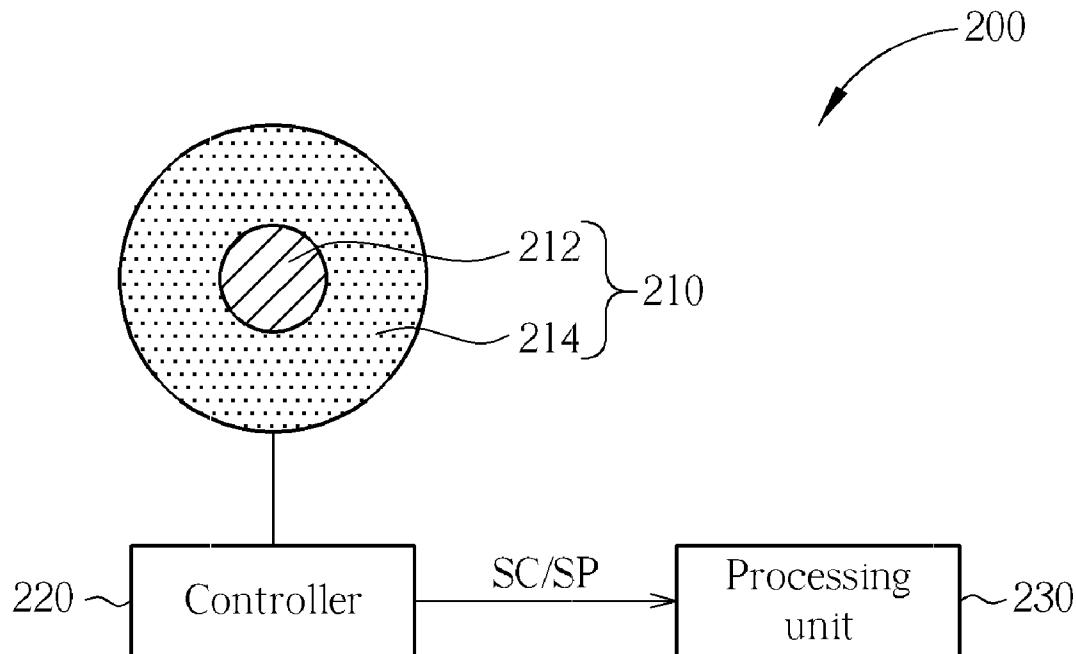
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(19) **United States**(12) **Patent Application Publication**
Wu et al.(10) **Pub. No.: US 2009/0160806 A1**(43) **Pub. Date: Jun. 25, 2009**(54) **METHOD FOR CONTROLLING
ELECTRONIC APPARATUS AND APPARATUS
AND RECORDING MEDIUM USING THE
METHOD****Related U.S. Application Data**(60) Provisional application No. 61/015,671, filed on Dec.
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G05B 15/00 (2006.01)(52) **U.S. Cl.** **345/173; 700/83**(57) **ABSTRACT**

A method for controlling an electronic apparatus, and an apparatus and a recording medium using the method are disclosed. The method includes: detecting a moving motion on a central sensitive module and a peripheral sensitive module surrounding the central sensing module to generate a central sensing signal and a peripheral sensing signal, respectively, corresponding to the moving motion; and controlling the electronic apparatus to execute a predetermined function when the moving motion is determined starting from the central sensing region according to the central sensing signal and the peripheral sensing signal.

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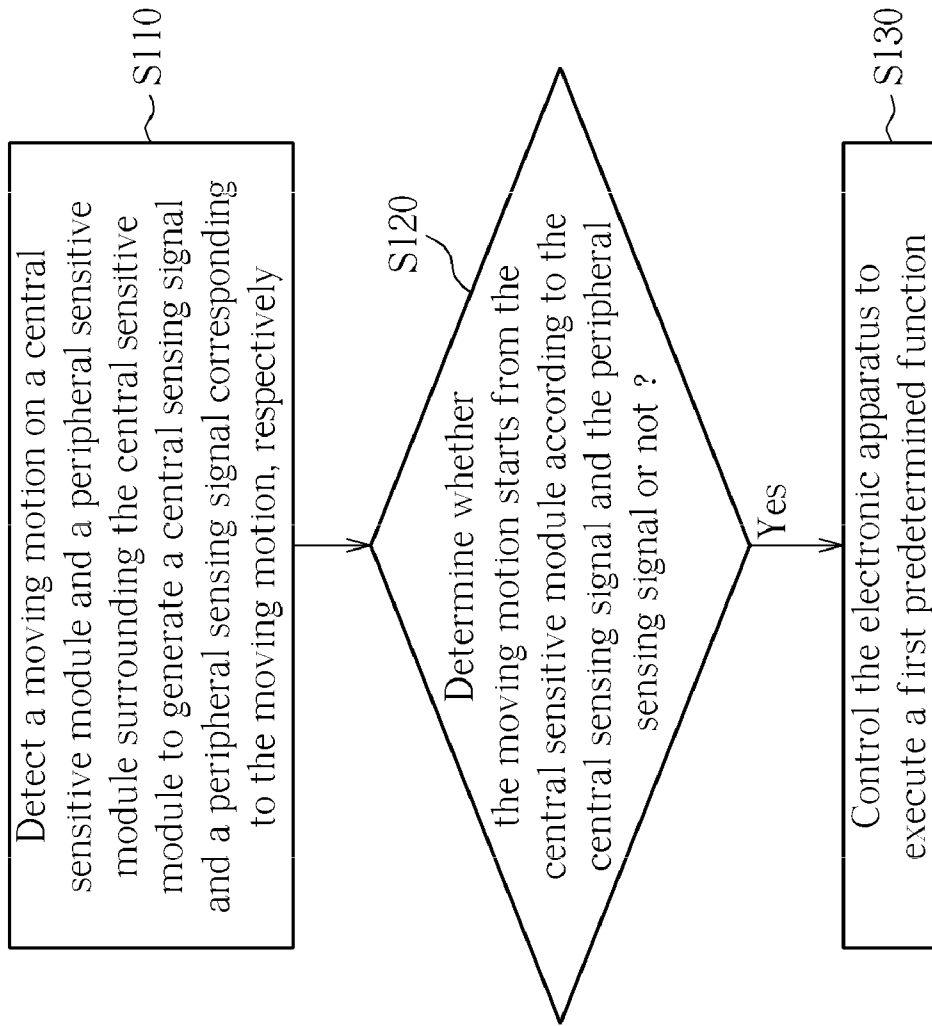


FIG. 1

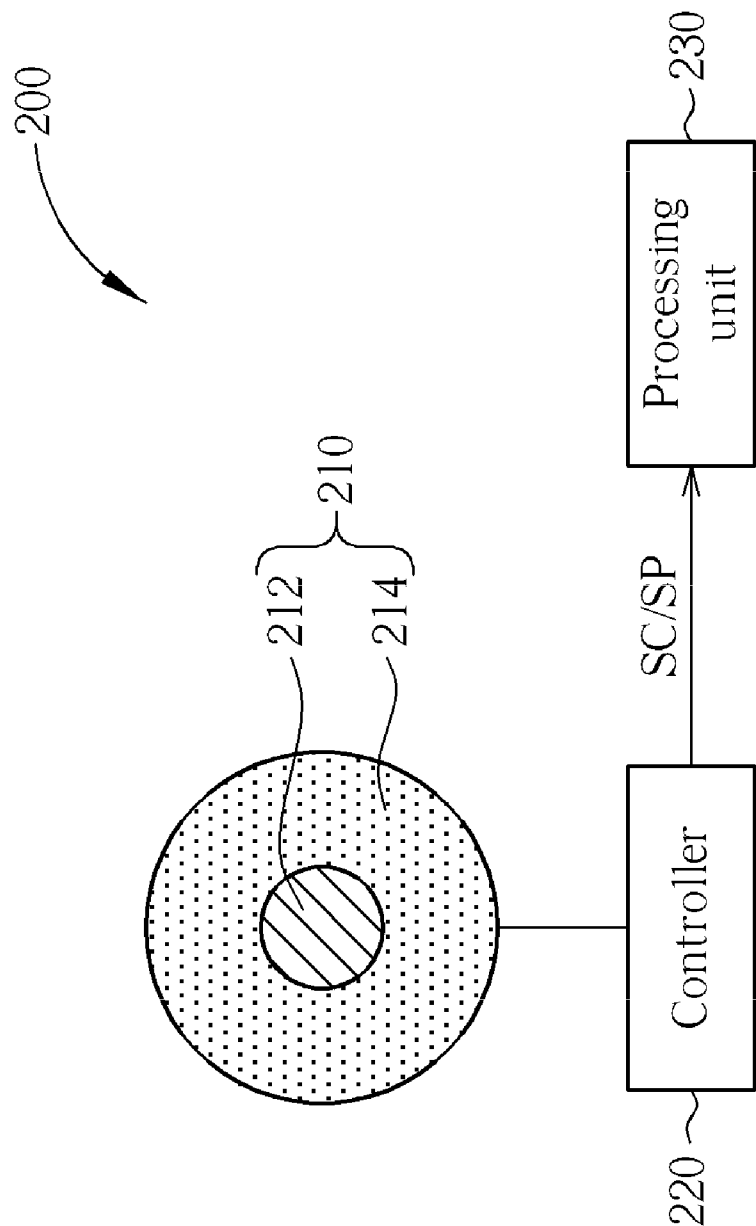


FIG. 2

METHOD FOR CONTROLLING ELECTRONIC APPARATUS AND APPARATUS AND RECORDING MEDIUM USING THE METHOD

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This non-provisional application claims the benefit of U.S. provisional application No. 61/015,671, filed on Dec. 21, 2007 and included herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The application relates to a control method of an electronic apparatus, and more particularly, to a method of controlling an electronic apparatus to execute a predetermined function, and an apparatus and a recording medium using the method.

[0004] 2. Description of the Prior Art

[0005] In the present time, a common way of controlling an electronic apparatus is using a touch control method. Generally speaking, an electronic apparatus includes a touch sensitive module on which a user can move their fingers to perform different predetermined functions of the electronic apparatus. Therefore, the electronic apparatus must be able to be controlled to execute different predetermined functions according to the user's different moving motions on the touch sensitive module.

SUMMARY OF THE INVENTION

[0006] In light of this, the application provides a control method of an electronic apparatus which detects whether a moving motion on a touch sensitive module of the electronic apparatus starts from a central region of the touch sensitive module to thereby control the electronic apparatus to execute a predetermined function. In this way, the aforementioned problem can be solved.

[0007] According to one embodiment of the application, a control method of an electronic apparatus is disclosed. The control method includes: detecting a moving motion on a central sensitive module and a peripheral sensitive module surrounding the central sensitive module to generate a central sensing signal and a peripheral sensing signal corresponding to the moving motion, respectively; and when the moving motion is determined starting from the central sensitive region according to the central sensing signal and the peripheral sensing signal, controlling the electronic apparatus to execute a first predetermined function.

[0008] According to another embodiment of the application, an electronic apparatus is disclosed. The electronic apparatus includes: a central sensitive module; a peripheral sensitive module, which surrounds the central sensitive module; a controller, which is coupled to the central sensitive module and the peripheral sensitive module, and is for detecting a moving motion on the central sensitive module and the peripheral sensitive module to generate a central sensing signal and a peripheral sensing signal corresponding to the moving motion, respectively; and a processing unit, which is coupled to the controller, and is for controlling an operation of the electronic apparatus according to the central sensing signal and the peripheral sensing signal. When the processing unit determines that the moving motion starts from the central sensitive module according to the central sensing signal and

the peripheral sensing signal, the processing unit controls the electronic apparatus to execute a first predetermined function.

[0009] According to yet another embodiment of the application, a recording medium is disclosed. The recording medium includes program codes for executing following steps: detecting a moving motion on the central sensitive module and the peripheral sensitive module to generate a central sensing signal and a peripheral sensing signal corresponding to the moving motion, respectively; and when the moving motion is determined starting from the central sensitive module according to the central sensing signal and the peripheral sensing signal, controlling the electronic apparatus to execute a first predetermined function.

[0010] These and other objectives of the application will no doubt become obvious to those of ordinary skill in the art after reading the following detailed description of the preferred embodiment that is illustrated in the various figures and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a flowchart of a control method for an electronic apparatus according to the application.

[0012] FIG. 2 is a block diagram of an exemplary embodiment of an electronic apparatus which employs the control method of the application.

DETAILED DESCRIPTION

[0013] Please refer to FIG. 1. FIG. 1 is a flowchart of a control method for an electronic apparatus according to the application. The control method is summarized as follows:

[0014] S110: Detect a moving motion on a central sensitive module and a peripheral sensitive module surrounding the central sensitive module to generate a central sensing signal and a peripheral sensing signal corresponding to the moving motion, respectively;

[0015] S120: Determine whether the moving motion starts from the central sensitive module according to the central sensing signal and the peripheral sensing signal. If so, go to step S130;

[0016] S130: Control the electronic apparatus to execute a first predetermined function.

[0017] Additionally, the application also provides an electronic apparatus which employs the control method described above. For example, the electronic apparatus is a handheld electronic apparatus (e.g., a cell phone, a smartphone, or a personal digital assistant). However, this is for illustrative purposes only, and is not meant to be a limitation of the application. Please refer to FIG. 2. FIG. 2 is one exemplary embodiment of an electronic apparatus 200 which employs the control method of the application. As shown in FIG. 2, the electronic apparatus 200 includes: a touch sensitive module 210, which comprises a central sensitive module 212 and a peripheral sensitive module 214 surrounding the central sensitive module 212; a controller 220, which is coupled to the central sensitive module 212 and the peripheral sensitive module 214, and is utilized for detecting a moving motion on the central sensitive module 212 and the peripheral sensitive module 214 to generate a central sensing signal SC and a peripheral sensing signal SP corresponding to the moving motion, respectively; and a processing unit 230, which is coupled to the controller 220, for controlling the operation of the electronic apparatus 200 according to the central sensing signal SC and the peripheral sensing signal SP. When the

processing unit 230 determines that the moving motion starts from the central sensitive module 212 according to the central sensing signal SC and the peripheral sensing signal SP, the processing unit 230 controls the electronic apparatus 200 to execute a first predetermined function.

[0018] In one embodiment of the application, the central sensitive module 212 includes a central touch pad and the peripheral sensitive module 214 includes at least a peripheral touch pad. For example, the peripheral sensitive module 214 can be a single touch pad surrounding the central touch pad 212, or multiple peripheral touch pads surrounding the central touch pad 212 (not shown in FIG. 2). In addition, in another embodiment of the application, the central sensitive module 212 and the peripheral sensitive module 214 can be one single touch pad, which is divided into the central sensitive module 212 and the peripheral sensitive module 214 by a determination of software.

[0019] To further address the control method of the electronic apparatus of the application described above, the following will take the electronic apparatus 200 as an example.

[0020] In one exemplary embodiment of the application, the first predetermined function is a panning function. When a user's finger is moving from the central sensitive module 212 to the peripheral sensitive module 214 of the electronic apparatus 200, the controller 220 first detects the moving motion of the user's finger on the central sensitive module 212 to generate a central sensing signal SC, and then detects the moving motion on the peripheral sensitive module 214 to generate a peripheral sensing signal SP. Therefore, the processing unit 230 can determine that the moving motion of the user's finger starts from the central sensitive module according to the generation time of the central sensing signal SC and the peripheral sensing signal SP, and then the processing unit 230 will further control the electronic apparatus 200 to perform the panning function, such as moving a map or a picture displayed on the screen of the electronic apparatus 200 in various directions, or moving a list (e.g., a contact list, a song list, or a file name list) displayed on the screen upward or downward.

[0021] For example, when a user's finger touches the central sensitive module 212 and moves upward to the peripheral sensitive module 214, a map displayed on the screen of the electronic apparatus 200 is moved upward in a panning way, allowing the user to see the upper part of the map displayed previously. Likewise, when the user's finger touches the central sensitive module 212 and moves downward, leftward, rightward, or right upward to the peripheral sensitive module 214, the map displayed on the screen of the electronic apparatus 200 will be moved downward, leftward, rightward, or right upward accordingly in a panning way.

[0022] In addition, in one embodiment of the application, when a user's finger touches the central sensitive module 212 and moves upward to the peripheral sensitive module 214, then a map displayed on the screen of the electronic apparatus 200 is moved upward in a panning way. Next, if the user's finger moves around the central sensitive module 212 on the peripheral sensitive module 214 to a downward position relative to the central sensitive module 212, the map displayed on the screen of the electronic apparatus 200 changes to be moved downward. That is to say, when the user's finger moves from the central sensitive module 212 to the peripheral sensitive function 214 and starts a panning function, the user can move his/her finger around the central sensitive module 212 on the peripheral sensitive module 214 to any position

relative to the central sensitive module 212 in order to change the direction of the panning function, then the map displayed on the screen of the electronic apparatus 200 will be moved according to the direction of the position of the user's finger relative to the central sensitive module 212.

[0023] In one embodiment of the application, signal intensities of the central sensing signal and the peripheral sensing signal correspond to the touched areas of the user's finger on the central sensitive module 212 and the peripheral sensitive module 214, respectively. To prevent the processing unit 230 from controlling the electronic apparatus 200 to execute the panning function due to a user's finger only touching a small area of the central sensitive module 212 and moving to the peripheral sensitive module 214, the processing unit 230 controls the electronic apparatus 200 to execute the panning function only when the intensity of the central sensitive signal SC is greater than a predetermined signal intensity; otherwise, the processing unit 230 ignores the central sensing signal SC.

[0024] In another embodiment of the application, the electronic apparatus 200 further includes a button element located under the central sensitive module 212, and the controller 220 is further coupled to the button element to detect a pressing motion on the button element. When the controller 220 detects the pressing motion, the controller 220 further detects a signal intensity of a pressing sensing signal generated from the pressing motion, and determines the predetermined signal intensity based on the signal intensity of the pressing sensing signal. For example, the predetermined signal intensity can be more than 70% of the signal intensity of the pressing motion generated from the pressing motion (e.g., the predetermined signal intensity is 80% of the signal intensity of the pressing motion). In this case, only when the processing unit 230 determines that a moving motion starts from the central sensitive module 212 according to the central sensing signal SC and peripheral signal SP, and the signal intensity of the central sensing signal SC is greater than the predetermined signal intensity (i.e., 80% of the signal intensity of the pressing motion), the processing unit 230 controls the electronic apparatus 200 to execute the panning function. In this way, user's accidental touch on the central sensitive module 212, which leads to the processing unit 230 controlling the electronic apparatus 200 to execute the panning unexpectedly, can be prevented.

[0025] Furthermore, in another embodiment of the application, when the processing unit 230 determines that an angular velocity of the moving motion on the peripheral sensitive module 214 is greater than a predetermined angular velocity while the electronic apparatus 200 is executing the first predetermined function, the processing unit 230 then controls the electronic apparatus 200 to execute a second predetermined function different from the first predetermined function. For example, in one embodiment of the application, the second predetermined function is a wheeling function. If the user's finger alters to wheel on the peripheral sensitive module 214 after the user's finger moving outward from the central sensitive module 212 to the peripheral sensitive module 214, and the processing unit 230 determines that the angular velocity of the user's moving motion is greater than a predetermined angular velocity according to the peripheral sensing signal SP, the processing unit 230 will no longer control the electronic apparatus 200 to execute the first predetermined function (e.g., the panning function) but will control the electronic apparatus 200 to execute the wheeling function, such as

adjusting sound volume, shrinking display screen, or moving displayed lists (e.g., contact list, song list, filename list and so on) upward/downward.

[0026] The application also provides a recording medium for recording a computer program used to perform the aforementioned control method of an electronic apparatus. The computer program is basically composed of multiple program code segments (e.g., a program code segment of establishing an organization chart, a program code segment of sign-off forms, a program code segment of configuration, and a program code segment of allocation), and after those program code segments are loaded and executed in an electronic device (e.g., the electronic device 200), the above-mentioned steps and functions of the aforementioned control method of the electronic device are then accomplished.

[0027] Briefly summarized, in accordance with the application, a control method of an electronic apparatus, and an apparatus and a using the control method detect whether a moving motion on a touch sensitive module of an electronic apparatus starts from a central sensitive module or not to selectively control the electronic apparatus to execute a first predetermined function (e.g., a panning function). If the moving motion starts from the central sensitive module, the electronic apparatus is controlled to execute the first predetermined function; otherwise, the electronic apparatus is not controlled to execute the first predetermined function. In addition, if an angular velocity of the moving motion is greater than a predetermined angular velocity, the electronic apparatus is controlled to execute a second predetermined function (e.g., a wheeling function). In this way, a user can control the electronic apparatus to execute a panning function or a wheeling function by the starting position and moving trace (e.g., wheeling) of his/her finger moving on the touch sensitive module.

[0028] Those skilled in the art will readily observe that numerous modifications and alterations of the device and method may be made while retaining the teachings of the invention. Accordingly, the above disclosure should be construed as limited only by the metes and bounds of the appended claims.

What is claimed is:

1. A control method of an electronic apparatus, comprising:

detecting a moving motion on a central sensitive module and a peripheral sensitive module to generate a central sensing signal and a peripheral sensing signal corresponding to the moving motion, respectively; and

when the moving motion is determined starting from the central sensitive module according to the central sensing signal and the peripheral sensing signal, controlling the electronic apparatus to execute a first predetermined function.

2. The control method of claim 1, wherein the step of controlling the electronic apparatus to execute the first predetermined comprises:

when the moving motion is determined starting from the central sensitive module according to the central sensing signal and the peripheral sensing signal, and a signal intensity of the central sensing signal is determined greater than a predetermined signal intensity, controlling the electronic apparatus to execute the first predetermined function.

3. The control method of claim 2, further comprising:

when a pressing motion on a button element located under the central sensitive module is detected, detecting a signal intensity of a pressing sensing signal generated from the pressing motion on the central sensitive module; and determining the predetermined signal intensity according to the signal intensity of the pressing sensing signal.

4. The control method of claim 3, wherein the signal intensity corresponds to a touched area on the central sensitive module.

5. The control method of claim 3, wherein the predetermined signal intensity is more than 70% of the signal intensity of the pressing sensing signal.

6. The control method of claim 1, further comprising:

when an angular velocity of the moving motion is determined greater than a predetermined angular velocity according to the peripheral sensing signal while the electronic apparatus is executing the first predetermined function, controlling the electronic apparatus to execute a second predetermined function different from the first predetermined function.

7. The control method of claim 6, wherein the first predetermined function is a panning function.

8. The control method of claim 6, wherein the second predetermined function is a wheeling function.

9. The control method of claim 7, further comprising:

determining a direction of the moving motion on the peripheral sensitive module relative to the central sensitive module according to the peripheral sensing signal; determining a moving direction of the panning function according to the direction of the moving motion.

10. The control method of claim 9, further comprising:

when the change of the direction of the moving motion on the peripheral sensitive module relative to the central sensitive module is determined according to the peripheral sensing signal, determining the moving direction of the panning according to the changed direction of the moving motion.

11. An electronic apparatus, comprising:

a touch sensitive module, comprising:

a central sensitive module; and

a peripheral sensitive module, surrounding the central sensitive module;

a controller, coupled to the central sensitive module and the peripheral sensitive module, for detecting a moving motion on the central sensitive module and the peripheral sensitive module to generate a central sensing signal and a peripheral sensing signal corresponding to the moving motion, respectively; and

a processing unit, coupled to the controller, for controlling an operation of the electronic apparatus according to the sensing signal;

wherein when the processing unit determines that the moving motion starts from the central sensitive module according to the central sensing signal and the peripheral sensing signal, the processing unit controls the electronic apparatus to execute a first predetermined function.

12. The electronic apparatus of claim 11, wherein when the processing unit determines that the moving motion starts from the central sensitive module according to the central sensing signal and the peripheral sensing signal and determines that a signal intensity of the central sensing signal is

greater than a predetermined signal intensity, the processing unit controls the electronic apparatus to execute the first predetermined function.

13. The electronic apparatus of claim **12**, wherein the central sensitive module further comprises a button element located under the central sensitive module and coupled to the controller; the controller is further for detecting a pressing motion on the button element;

when the controller detects the pressing motion, the controller further detects a signal intensity of a pressing sensing signal generated from the pressing motion on the central sensitive module; and

the processing unit determines the predetermined signal intensity according to the signal intensity of the pressing sensing signal.

14. The electronic apparatus of claim **13**, wherein the signal intensity corresponds to a touched area on the central sensitive module.

15. The electronic apparatus of claim **11**, wherein the processing unit determines that an angular velocity of the moving motion is greater than a predetermined angular velocity according to the peripheral sensing signal while the electronic apparatus is executing the first predetermined function, the processing unit controls the electronic apparatus to execute a second predetermined function different from the first predetermined function.

16. The electronic apparatus of claim **15**, wherein the first predetermined function is a panning function.

17. The electronic apparatus of claim **15**, wherein the second predetermined function is a wheeling function.

18. The electronic apparatus of claim **16**, wherein the processing unit determines a direction of the moving motion on the peripheral sensitive module relative to the central sensitive module according to the peripheral sensing signal; the processing unit determines a moving direction of the panning function according to the direction of the moving motion; and when the processing unit determines that the direction of the moving motion on the peripheral sensitive module relative to the central sensitive module is changed according to the peripheral sensing signal, the processing unit determines the moving direction of the panning according to the changed direction of the moving motion.

19. The electronic apparatus of claim **11**, wherein the central sensitive module comprises a central touch pad, and the peripheral sensitive module comprises at least a peripheral touch pad.

20. A recording medium containing instructions for performing the method of claim **1**.

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