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(71) Applicant: **TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)** [SE/SE]; Torshamnsgatan 21-23, S-164 83 Stockholm (SE).

(72) Inventors: **ZHANG, Guoqiang;** Huvudstagatan 28, S-17158 Stockholm (SE). **ARAÚJO, Jose;** Sandhamnsgatan 57A, lgh 1307, S-1 1528 Stockholm (SE). **ANDERSSON, Lars;** Edvin Adolphsons väg 9, S-16940 Solna (SE).

(74) Agent: **ERICSSON;** Patent Development Torshamnsgatan 21-23, 164 80 Stockholm (SE).

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(54) Title: ELECTRONIC DEVICE AND METHOD FOR CONTROLLING CAMERAS THEREOF

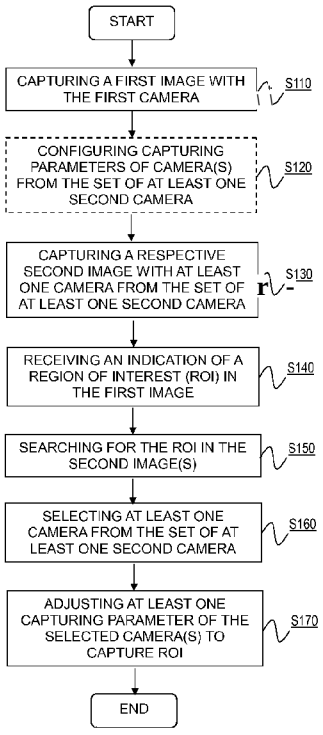

FIG. 3

(57) Abstract: The present invention provides a method for an electronic device (100) comprising a first camera (101) and a set of at least one second camera (102). The method comprises capturing (SI 10) a first image with the first camera (101). The method comprises capturing (SI 30) a respective second image with the camera(s) from the set of at least one second camera (102). The method comprises receiving (S140) an indication of a region of interest (ROI) in the first image. The method comprises searching (SI 50) for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera (102). The method comprises selecting (S160) at least one camera from the set of at least one second camera (102) that captures a second image comprising at least a part of the ROI. The method comprises adjusting (S170) the at least one capturing parameter of the selected camera(s) to capture the ROI.

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ELECTRONIC DEVICE AND METHOD FOR CONTROLLING CAMERAS THEREOF

TECHNICAL FIELD

The present invention relates generally to electronics technology, and more particularly, to an electronic device and a method for controlling cameras of an electronic device.

BACKGROUND

Nowadays, electronic devices such as smart phone, tablet, PDA, head mounted display (HMD), are commonplace in everyday life. With various built-in sensors like camera, microphone, accelerometer, and so on, electronic devices are able to perform different tasks. For instance, the cameras and microphones of an electronic device make it possible to establish a video conference to a remote device, and the accelerometer of the electronic device allows it to detect user's activity.

Also, there is a tendency to increase the number of sensors in an electronic device. For example, recent smart phones usually have two cameras (a front camera and a rear camera). The two cameras bring new applications which are hard or even impossible to be realized by using only a single camera. The issued U.S. Patent No. 8,451 ,994 provides a method for switching cameras of a multi-camera mobile device during a video conference (such as switching from the rear camera to the front camera on a mobile phone). This document also proposes controlling a camera by interacting with an image captured by the camera and then informing the camera to perform a particular operation (e.g., zooming in/out, changing exposure time).Therefore, different cameras of a multi-camera mobile device can be controlled separately through their respective images.

SUMMARY

However, it might not be convenient to control a plurality of cameras of an electronic device separately in some situations. For instance, considering a situation where an expert remotely helps an engineer to fix a machine. It is assumed that the engineer wears a device (e.g., a head mounted display (HMD)) which has a photo/video camera and an IR camera. The expert has access to the

images of the two cameras through a video conference. The expert may want to check which components of the machine are too hot from the image captured by the IR camera and then manipulate the photo/video camera to zoom in on the hot components. However, this is not convenient because the expert has to move back and forth between the images of the two cameras.

It is therefore an object of the present invention to provide a method for controlling one or more second camera(s) of an electronic device through an image of a first camera of the electronic device. At least some of the cameras of the electronic device are able to roughly capture the same scene. The image captured by one camera of the electronic device can be used to control one or more other cameras of the electronic device.

In a first aspect of the present invention, a method for an electronic device comprising a first camera and a set of at least one second camera is provided. The method comprises capturing a first image with the first camera. The method comprises capturing a respective second image with the camera(s) from the set of at least one second camera. The method further comprises receiving an indication of a region of interest (ROI) in the first image. The method comprises searching for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera. The method comprises selecting at least one camera from the set of at least one second camera that captures a second image comprising at least a part of the ROI. The method comprises adjusting the at least one capturing parameter of the selected camera(s) to capture the ROI.

In an embodiment, the method further comprises configuring capturing parameters of camera(s) from the set of at least one second camera based on at least one capturing parameter of the first camera. This means that the capturing parameters of the first camera are utilized to assist with the configuration of the capturing parameters of the cameras from the set of at least one second camera, facilitating the searching of the ROI in the second image(s).

In an embodiment, the cameras of the electronic device can be controlled locally via an interface unit of the electronic device. For example, the interface unit may comprise a touch screen, a keyboard, or a pointing device. Alternatively, the cameras of the electronic device can be controlled remotely. For example,

indication of the ROI may be received via a communication port of the electronic device through a video conference.

In an embodiment, if the first camera and the second cameras are of the same type, searching for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera may comprises resampling the ROI and/or the second image captured by the camera(s) from the set of at least one second camera based on the capturing parameters of the first camera and the set of at least one second camera, and identifying the region in the resampled second image captured by the camera(s) from the set of at least one second camera where at least a part of the processed ROI is located. The "resampling" herein refers to increasing or reducing the image resolution. Thus, the processed ROI and the processed image will have the same scale so that the searching of ROI can be performed conveniently.

In an embodiment, searching for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera may comprise extracting features from the ROI in the first image and each second image and identifying the region in each second image by matching the features in the ROI with those in each second image. By doing so, the searching of ROI in the second image(s) can be performed successfully even if the first camera and the second cameras are of different types.

In an embodiment, the capturing parameter may comprise focal length or exposure time. Alternatively, the capturing parameter may comprise image size or orientation of the camera lens.

In an embodiment, the number of the selected cameras is two and the selected cameras are configured to capture a stereo image. Thus, stereo information with high accuracy can be provided.

In a second aspect of the present invention, an electronic device is provided. The electronic device comprises a first camera configured to capture a first image and a set of at least one second camera configured to capture a respective second image. The electronic device further comprises an interface unit configured to receive an indication of a region of interest (ROI) in the first image. The electronic

device further comprises a controller configured to search for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera, select at least one camera from the set of at least one second camera that captures a second image comprising at least a part of the ROI, and adjust the at least one capturing parameter of the selected camera(s) to capture the ROI.

In an embodiment, the electronic device may comprise any of a mobile phone, a tablet, a head mounted display (HMD), or a personal digital assistant (PDA).

In a third aspect of the present invention, a computer program product comprising computer program code means is provided. The computer program code means cause, when executed by an electronic device comprising a first camera and a set of at least one second camera, the electronic device to perform the method in accordance with the first aspect of the present invention.

In a fourth aspect of the present invention, a computer readable medium is provided. The computer readable medium has stored thereon the computer program product in accordance with the third aspect of the present invention.

With the embodiments of the present invention, it is possible to manipulate multiple cameras of an electronic device by using the image of one camera of the electronic device. Accordingly, the cameras of the electronic device can be controlled in a more flexible and efficient way.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages will be more apparent from the following description of embodiments with reference to the figures, in which:

Fig. 1 is a schematic diagram showing an exemplary structure of an electronic device having a first camera and a second camera;

Fig. 2 is a schematic diagram showing common view regions in an electronic device having multiple cameras;

Fig. 3 is a flowchart illustrating a method for controlling one or more second camera(s) of an electronic device through an image of

a first camera of the electronic device according to an embodiment of the present invention;

Fig. 4 is a flowchart illustrating a method for searching for the ROI in the second image according to an embodiment of the present invention;

Fig. 5 is a flowchart illustrating a method for searching for the ROI in the second image according to another embodiment of the present invention;

Fig. 6 is a schematic diagram showing an example in which the second camera is controlled locally through a touch screen of the electronic device;

Fig. 7 is a schematic diagram showing an example in which the second camera of an electronic device is controlled through a video reference;

Fig. 8 is a block diagram of an electronic device according to an embodiment of the present invention; and

Fig. 9 is a block diagram of a computer readable medium having stored thereon a computer program product according to an embodiment of the present invention.

DETAILED DESCRIPTION

The embodiments of the present invention will be detailed below with reference to the drawings. It should be noted that the following embodiments are illustrative only, rather than limiting the scope of the disclosure.

Fig. 1 is a schematic diagram showing an exemplary structure of an electronic device having a first camera and a second camera. As shown in Fig. 1, the electronic device 100 comprises a first camera 101 and a second camera 102. The cameras 101 and 102 may be of the same type or of different types. For example, both the first and second cameras 101 and 102 may be photo/video cameras. Alternatively, the first camera 101 may be an IR camera and the second camera 102 may be a photo/video camera. It should be understood that the types of the cameras are not limited thereto.

In the example shown in Fig. 1, each of the cameras 101 and 102 has a cone-shaped view region. Since the lenses of the two cameras 101 and 102 are

roughly facing towards the same direction, their view regions overlap. The overlapped view region is referred herein as the "common view region," such as the common view region 103 in Fig. 1.

The present disclosure is not limited to the scenario of two cameras as shown in Fig. 1. It should be understood that the present disclosure is applicable to an electronic device having more than two cameras which share common view regions. Fig. 2 is a schematic diagram showing common view regions in an electronic device having multiple cameras. As shown in Fig. 2, there is a plurality of common view regions 201 , 202, and 203, etc.

Fig. 3 is a flowchart illustrating a method for controlling one or more second camera(s) of an electronic device through an image of a first camera of the electronic device according to an embodiment. The method may be performed by an electronic device (e.g., electronic device 100 as shown in Fig. 8, as detailed below). The method includes the following steps.

At step S110, a first image is captured with the first camera of the electronic device. For example, the first camera may be a photo/video camera and the first image is a photo or a frame from a video captured by the first camera. Alternatively, the first camera may be an infrared (IR) camera and the first image is an IR image captured by the IR camera.

Optionally, at step S120, capturing parameters of camera(s) from the set of at least one second camera may be configured based on at least one capturing parameter of the first camera. That is, the capturing parameters of the first camera may be utilized to assist with the configuration of the capturing parameters of the cameras from the set of at least one second camera, which can facilitate the searching of the ROI in the second image(s), as detailed below.

At step S130, a respective second image is captured with the camera(s) from the set of at least one second camera of the electronic device. Similarly, the second camera may be a photo/video camera or an IR camera or other types of cameras.

At step S140, an indication of a region of interest (ROI) in the first image is received. The electronic device may comprise an interface unit and the indication

may be received via the interface unit. In one example, the interface unit may comprise a touch screen, a keyboard, or a pointing device, etc, and the indication can be received locally. In another example, the interface unit may comprise a communication port which is configured to receive the indication of the ROI through a video conference. In this example, the electronic device can receive the indication remotely from other sites.

At step S150, the ROI are searched for in the second image(s) captured by the camera(s) from the set of at least one second camera. As mentioned above, capturing parameters of camera(s) from the set of at least one second camera may be configured based on at least one capturing parameter of the first camera, which can facilitate the searching of the ROI in the second image(s). For instance, if a second camera has the same capturing parameter (such as focal length or the exposure time) as the first camera, the ROI in the second image will have similar pixel values as the ones in the first image, which makes the search much easier. Another scenario is that every camera can change the orientation of its lens on the electronic device. In this case, each second camera can adjust the orientation of its lens based on the orientation of the first camera in order to maximize the common view region. The capturing parameters may include focal length, exposure time, image size, orientation of the camera lens, and so on.

In one example, if the first and second cameras are photo/video cameras, pixel values of the images captured by the first and second cameras can be used directly to search the ROI. Preferably, the ROI and/or the images may be resampled so that the processed ROI and/or the processed images will have the same scale. The operation of "resampling" herein refers to increasing or reducing the image resolution. The detailed procedure of this example will be explained below in connection with Fig. 4.

Fig. 4 is a flowchart illustrating a method for searching for the ROI in the second image according to an embodiment. As shown in Fig. 4, at step S1510, the ROI and/or images from the second cameras may be resampled based on the capturing parameters of the first camera and the set of at least one second camera. At step S1530, the region can be identified in the processed image by matching the processed ROI with a block in the processed image.

In another example, the first and second cameras are of different types. For instance, the first camera may be an infrared camera and the second cameras may be photo/video cameras. In this case, features may be extracted from the ROI and the second images and then the searching procedure may be performed by matching the features in the ROI with those in the images. For example, [1] provides a method for registering an infrared image and a visible image by extracting and matching features, the principle of which can be used herein.

Fig. 5 is a flowchart illustrating a method for searching for the ROI in the second image according to this example. As shown in Fig. 5, at step S1540, features are firstly extracted from the ROI in the first image and each second image. At step S1550, the region in each second image is identified by matching the features in the ROI with those in the second images.

In the examples as mentioned above, matching may be performed in order to find the location of the ROI in each second image. For each second image, the highest matching score may be searched and compared with a threshold. If the highest matching score is above the threshold, the location of the ROI can be determined. If the highest matching score is below the threshold, the ROI is not determined to be in the image.

Referring back to Fig. 3, at step S160, at least one camera is selected from the camera(s) from the set of at least one second camera. The selected camera can capture an image comprising at least a part of the ROI. In other words, the selected camera and the first camera have overlapped view region in which at least a part of the ROI exists. Either all the cameras found in the step S 150 or the top k (k>0, which may be predetermined) cameras of them may be selected according to scores (high score means that the ROI is found in the image with a good match), such as the aforesaid matching scores.

At step S170, the at least one capturing parameter of the selected camera is adjusted to capture the ROI. For example, the capturing parameters of the selected camera may be calculated based on the location of the ROI found in its image. Then the selected camera may be adjusted to focus on and/or zoom in on the ROI.

In the following, several cases in which the method according to the present disclosure is applicable are described with Figs. 6-7.

Fig. 6 is a schematic diagram showing an example in which the second camera is controlled locally through a touch screen of the electronic device. As shown in Fig. 6, a mobile phone has two cameras sharing a common view region. The user of the mobile phone may use the first camera (camera 1) to capture the whole scene. The user may select a ROI in the image captured by the first camera by using the touch screen. The second camera (camera 2) then focuses on the selected ROI, which provides more detailed information of the ROI.

The electronic device may also comprise three or more cameras. In this case, the user of the electronic device may use one camera to capture a whole scene which contains a few objects. The user selects one object of interest in the form of ROI. The other cameras then focus on the selected object and can provide stereo information with high accuracy. It should be understood that the number of cameras is not limited.

Fig. 7 is a schematic diagram showing an example in which the second camera of an electronic device is controlled through a video reference. In this case, a video conference is utilized to control the cameras. For instance, an engineer who has an electronic device 100 comprising a first camera 101 and a second camera 102 may have a video conference with an expert at remote site through the network 703. The expert may have a mobile phone 704 or a computer 705 and help the engineer to fix a machine. Through the video conference, the expert has access to the images of the cameras 101 and 102 of the electronic device 100. The expert may want to see the whole scene through the first camera 101. At the same time, the expert can control the other camera 102 to focus on regions of interest remotely by manipulating the image captured by the first camera 101 through the video conference.

For example, the first camera 101 is an IR camera and the second camera 102 is a photo/video camera. The IR camera 101 can provide temperature information. The expert checks the image captured by the IR camera and may find some component in the machine is too hot. Thus the expert may simply select the component in the image captured by the IR camera. The photo/video camera

then zooms in on the selected component and provides details of the component for display.

Fig. 8 is a block diagram of an electronic device according to an embodiment. As shown in Fig. 8, the electronic device 100 comprises a first camera 101, a set of at least one second camera 102, a controller 830, and an interface unit 840.

The first camera 101 is configured to capture a first image. The set of at least one second camera 102 is configured to capture a respective second image. As mentioned above, the first and second cameras 101, 102 may be of the same type or different types. For example, the cameras 101, 102 may be an IR camera or a photo/video camera.

The interface unit 840 is configured to receive an indication of a region of interest (ROI) in the first image. For example, the interface unit 840 may comprise a touch screen, a keyboard, or a pointing device, etc. The interface unit 840 may also comprise a communication port configured to receive the indication of the ROI through a video conference.

The controller 830 is configured to search for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera 102, select at least one camera from the set of at least one second camera 102 that captures a second image comprising at least a part of the ROI, and adjust the at least one capturing parameter of the selected camera(s) to capture the ROI. Further, the controller 830 may adjust the selected camera(s) to focus on and/or zoom in on the ROI.

For example, if the first and second cameras 101, 102 are photo/video cameras, the controller 830 may resample the ROI and/or the second image captured by the camera(s) from the set of at least one second camera 102 based on the capturing parameters of the first camera 101 and the set of at least one second camera 102, and identify the region in the resampled second image captured by the camera(s) from the set of at least one second camera 102 where at least a part of the processed ROI is located.

Alternatively, if the first and second cameras are of different types, the controller 830 may extract features from the ROI in the first image and each second image, and identifies the region in each second image by matching the features in the ROI with those in each second image.

The controller 830 may be further configured to configure capturing parameters of camera(s) from the set of at least one second camera1 02 based on at least one capturing parameter of the first camera 101. For example, the capturing parameter may comprise focal length or exposure time, etc.

In one example, the first camera 101 may be an infrared camera. In another example, the number of the selected cameras is two and the selected cameras are configured to capture a stereo image.

The controller 830 may be implemented by a CPU (Central processing unit), and could also be implemented by other types of components. For example, the controller 830 may be implemented by general purpose microprocessors, instruction set processors and/or special purpose microprocessors such as Application Specific Integrated Circuit (ASICs).

The electronic device 100 as shown in Fig. 8 may have various types including, but is not limited to, a mobile phone, a tablet, a head mounted display (HMD), or a personal digital assistant (PDA), etc.

The embodiments of the present disclosure can be implemented in computer program products. This arrangement of the present disclosure is typically provided as software, codes and/or other data structures provided or coded on a computer readable medium (such as an optical medium, e.g., CD-ROM, a floppy disk or a hard disk), or firmware or micro codes on other mediums (such as one or more ROMs, RAMs or PROM chips), or downloadable software images or shared databases in one or more modules. The software, firmware or arrangement can be installed in an electronic device to cause the electronic device to perform the solutions according to the embodiments.

Fig. 9 is a block diagram of a computer readable medium having stored thereon a computer program product according to an embodiment. As shown in Fig. 9, a computer readable medium 902 has stored thereon a computer program product 901. The computer program product 901 may comprise computer program code means 900 for performing, when executed by an electronic device (such as the electronic device 100 comprising a first camera 101 and a set of at least one second camera 102 as shown in Fig. 8), the method according to the present disclosure as mentioned above.

The computer readable medium 902 may have the form of a non-volatile or volatile memory, e.g., an Electrically Erasable Programmable Read-Only Memory (EEPROM), a flash memory, a floppy disk, and a hard drive, etc. The computer program code means 900 may include codes/computer readable instructions in any format.

Conditional language used herein, such as "can," "might," "may," "e.g.," and the like, unless specifically stated otherwise, or otherwise understood within the context as used, is generally intended to convey that certain embodiments include, while other embodiments do not include, certain features, elements and/or states. Thus, such conditional language is not generally intended to imply that features, elements and/or states are in any way required for one or more embodiments or that one or more embodiments necessarily include logic for deciding, with or without author input or prompting, whether these features, elements and/or states are included or are to be performed in any particular embodiment. The terms "comprising," "including," "having," and the like are synonymous and are used inclusively, in an open- ended fashion, and do not exclude additional elements, features, acts, operations, and so forth. Also, the term "or" is used in its inclusive sense (and not in its exclusive sense) so that when used, for example, to connect a list of elements, the term "or" means one, some, or all of the elements in the list. Further, the term "each," as used herein, in addition to having its ordinary meaning, can mean any subset of a set of elements to which the term "each" is applied.

In addition, language such as the phrase "at least one of X, Y and Z," unless specifically stated otherwise, is to be understood with the context as used in general to convey that an item, term, etc. may be either X, Y, or Z, or a

combination thereof. Unless otherwise explicitly stated, articles such as "a" or "an" should generally be interpreted to include one or more described items. Accordingly, phrases such as "a device configured to" are intended to include one or more recited devices. Such one or more recited devices can also be collectively configured to carry out the stated recitations.

The disclosure has been described with reference to embodiments and drawings. It should be understood that various modifications, alternations and additions can be made by those skilled in the art without departing from the spirits and scope of the disclosure. Therefore, the scope of the disclosure is not limited to the above particular embodiments but only defined by the claims as attached and equivalents thereof.

REFERENCES

[1] Jungong Han, Eric Pauwels, and Paul de Zeeuw, "Visible and Infrared Image Registration Employing Line-Based Geometric Analysis", MUSCLE 201 1, LNCS 7252, pp. 114- 125, 2012.

CLAIMS

1. A method for an electronic device (100) comprising a first camera (101) and a set of at least one second camera (102), the method comprising:

capturing (S110) a first image with the first camera (101);

capturing (S130) a respective second image with at least one camera from the set of at least one second camera (102);

receiving (S140) an indication of a region of interest (ROI) in the first image;

searching (S150) for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera (102);

selecting (S160) at least one camera from the set of at least one second camera (102) that captures a second image comprising at least a part of the ROI; and

adjusting (S170) at least one capturing parameter of the selected camera(s) to capture the ROI.

2. The method according to claim 1, further comprising:

configuring (S120) capturing parameters of camera(s) from the set of at least one second camera (102) based on at least one capturing parameter of the first camera.

3. The method according to claim 1 or 2, wherein the indication of the ROI is received via an interface unit (840) of the electronic device (100), the interface unit (840) comprising any of a touch screen, a keyboard, or a pointing device.

4. The method according to claim 1 or 2, wherein the indication of the ROI is received via an interface unit (840) of the electronic device (100), the interface unit (840) comprising a communication port configured to receive the indication of the ROI through a video conference.

5. The method according to any of claims 1-4, wherein searching (S150) for the ROI in the second image captured by the camera(s) from the set of at least one second camera (102) comprises:

resampling (S1510) the ROI and/or the second image captured by the camera(s) from the set of at least one second camera (102) based on the capturing parameters of the first camera (101) and the set of at least one second camera (102); and

identifying (S1530) the region in the resampled second image captured by the camera(s) from the set of at least one second camera (102) where at least a part of the processed ROI is located.

6. The method according to any of claims 1-4, wherein searching (S150) the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera (102) comprises:

extracting (S1540) features from the ROI in the first image and each second image; and

identifying (S1550) the region in each second image by matching the features in the ROI with those in each second image.

7. The method according to any of the preceding claims, wherein the selected camera(s) is adjusted to focus on and/or zoom in on the ROI.

8. The method according to any of the preceding claims, wherein the at least one capturing parameter comprises any of focal length, exposure time, image size, or orientation of the camera lens.

9. The method according to any of the preceding claims, wherein the first camera (101) is an infrared camera.

10. The method according to any of the preceding claims, wherein the number of the selected cameras is two and wherein the selected cameras are configured to capture a stereo image.

11. An electronic device (100), comprising:

a first camera (101) configured to capture a first image;

a set of at least one second camera (102) configured to capture a respective second image;

an interface unit (840) configured to receive an indication of a region of interest (ROI) in the first image; and

a controller (830) configured to:

search for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera (102);

select at least one camera from the set of at least one second camera (102) that captures a second image comprising at least a part of the ROI; and

adjust the at least one capturing parameter of the selected camera(s) to capture the ROI.

12. The electronic device (100) according to claim 11, wherein the controller (830) is further configured to configure capturing parameters of camera(s) from the set of at least one second camera (102) based on at least one capturing parameter of the first camera (101).

13. The electronic device (100) according to claim 11 or 12, wherein the interface unit (840) comprises any of a touch screen, a keyboard, or a pointing device.

14. The electronic device (100) according to claim 11 or 12, wherein the interface unit (840) comprises a communication port configured to receive the indication of the ROI through a video conference.

15. The electronic device (100) according to any of claims 11-14, wherein the controller (830) is configured to search for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera (102) by:

resampling the ROI and/or the second image captured by the camera(s) from the set of at least one second camera (102) based on the

capturing parameters of the first camera (101) and the set of at least one second camera (102); and

identifying the region in the resampled second image captured by the camera(s) from the set of at least one second camera (102) where at least a part of the processed ROI is located.

16. The electronic device (100) according to any of claims 11-14, wherein the controller (830) is configured to search for the ROI in the second image(s) captured by the camera(s) from the set of at least one second camera (102) by:

extracting features from the ROI in the first image and each second image; and

identifying the region in each second image by matching the features in the ROI with those in each second image.

17. The electronic device (100) according to any of claims 11-16, wherein the controller (830) is configured to adjust the selected camera(s) to focus on and/or zoom in on the ROI.

18. The electronic device (100) according to any of claims 11-17, wherein the at least one capturing parameter comprises any of focal length, exposure time, image size, or orientation of the camera lens.

19. The electronic device (100) according to any of claims 11-18, wherein the first camera (101) is an infrared camera.

20. The electronic device (100) according to any of claims 11-19, wherein the number of the selected cameras is two and wherein the selected cameras are configured to capture a stereo image.

21. The electronic device (100) according to any of claims 11-20, wherein the electronic device (100) comprises any of a mobile phone, a tablet, a head mounted display (HMD), or a personal digital assistant (PDA).

22. A computer program product (901) comprising computer program code means (900) for performing, when executed by an electronic device (100) comprising a first camera (101) and a set of at least one second camera (102), the method according to any of claims 1 to 10.

23. A computer readable medium (902) having stored thereon the computer program product (901) according to claim 22.

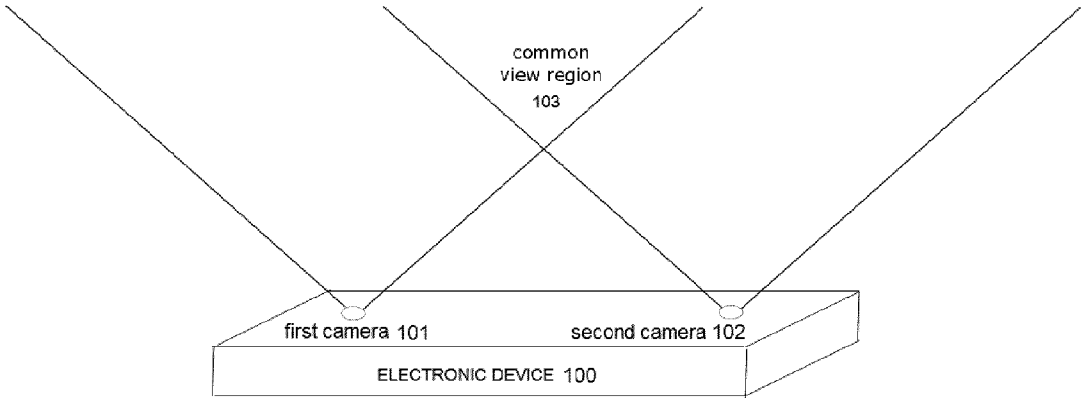
common
view region
103
first camera 101
second camera 102
ELECTRONIC DEVICE 100

FIG. 1

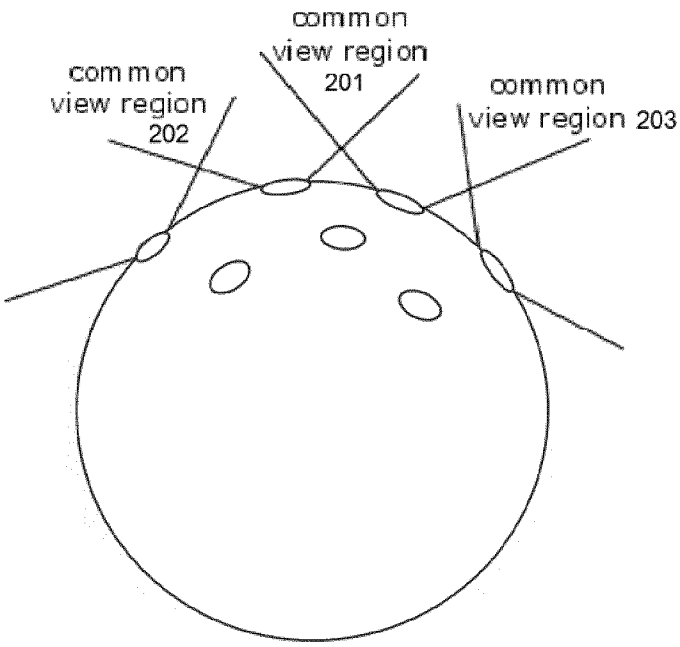
common
view region
201
common
view region
202
common
view region 203

FIG. 2

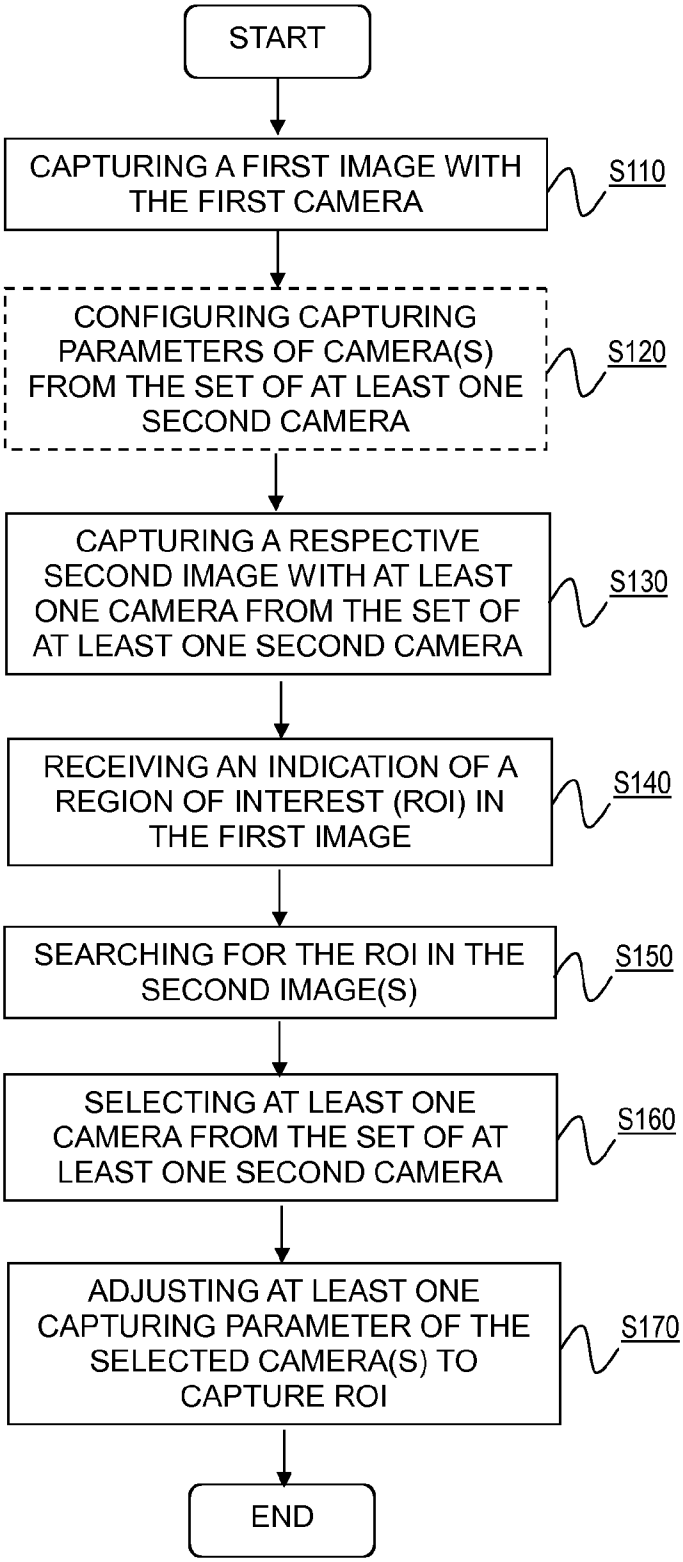
START
CAPTURING A FIRST IMAGE WITH THE FIRST CAMERA
S110
CONFIGURING CAPTURING PARAMETERS OF CAMERA(S) FROM THE SET OF AT LEAST ONE SECOND CAMERA
S120
CAPTURING A RESPECTIVE SECOND IMAGE WITH AT LEAST ONE CAMERA FROM THE SET OF AT LEAST ONE SECOND CAMERA
S130
RECEIVING AN INDICATION OF A REGION OF INTEREST (ROI) IN THE FIRST IMAGE
S140
SEARCHING FOR THE ROI IN THE SECOND IMAGE(S)
S150
SELECTING AT LEAST ONE CAMERA FROM THE SET OF AT LEAST ONE SECOND CAMERA
S160
ADJUSTING AT LEAST ONE CAPTURING PARAMETER OF THE SELECTED CAMERA(S) TO CAPTURE ROI
S170
END

FIG. 3

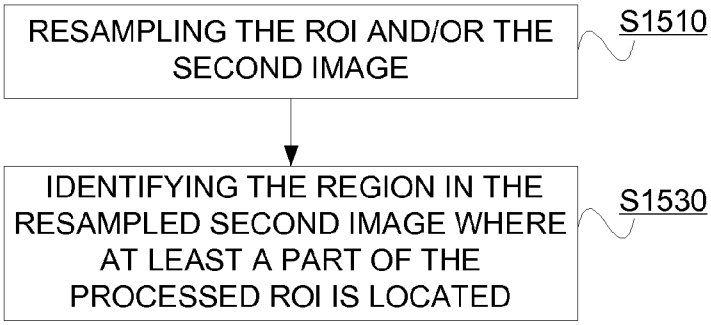
RESAMPLING THE ROI AND/OR THE SECOND IMAGE
S1510
IDENTIFYING THE REGION IN THE RESAMPLED SECOND IMAGE WHERE AT LEAST A PART OF THE PROCESSED ROI IS LOCATED
S1530

FIG. 4

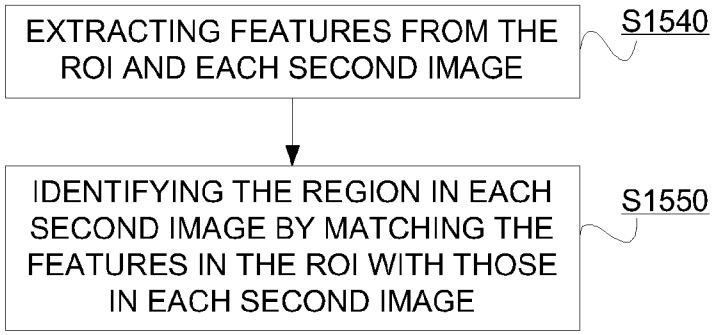
EXTRACTING FEATURES FROM THE ROI AND EACH SECOND IMAGE
S1540
IDENTIFYING THE REGION IN EACH SECOND IMAGE BY MATCHING THE FEATURES IN THE ROI WITH THOSE IN EACH SECOND IMAGE
S1550

FIG. 5

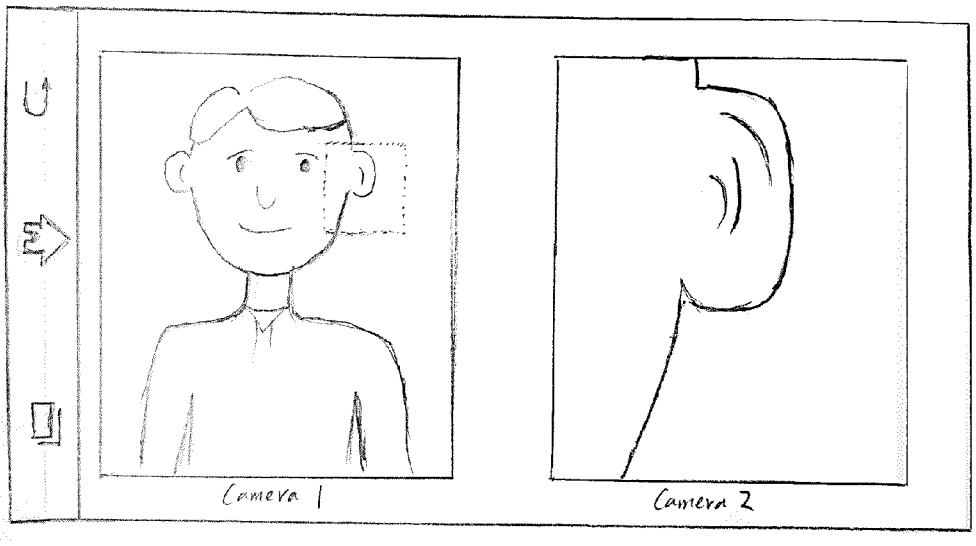
Camera 1
Camera 2

FIG. 6

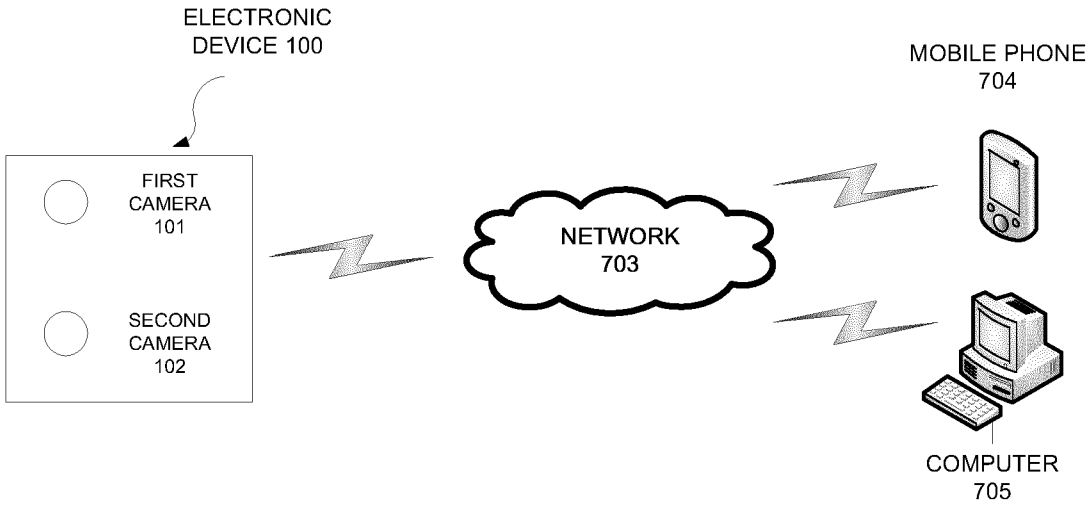
ELECTRONIC DEVICE 100
FIRST CAMERA 101
SECOND CAMERA 102
NETWORK 703
MOBILE PHONE 704
COMPUTER 705

FIG. 7

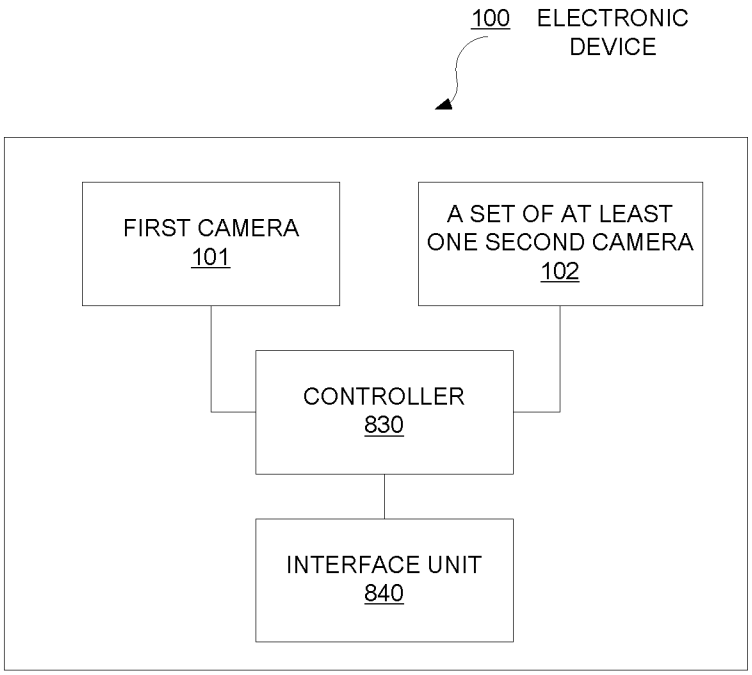
100 ELECTRONIC DEVICE
FIRST CAMERA 101
A SET OF AT LEAST ONE SECOND CAMERA 102
CONTROLLER 830
INTERFACE UNIT 840

FIG. 8

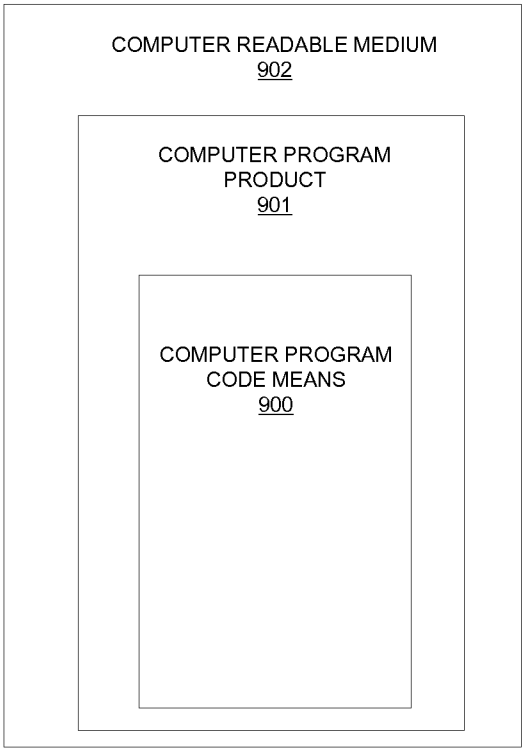
COMPUTER READABLE MEDIUM 902
COMPUTER PROGRAM PRODUCT 901
COMPUTER PROGRAM CODE MEANS 900

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/078381

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04N7/18
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/056056 A1 (AHISKA BARTU [GB] ET AL) 16 March 2006 (2006-03-16) abstract figures 1,7,8 paragraphs [0015] - [0022] paragraphs [0035] - [0060] paragraphs [0062] - [0071] paragraphs [0092] - [0100] paragraph [0124]	1-23
A	US 2014/267549 A1 (PINTER MARCO [US] ET AL) 18 September 2014 (2014-09-18) abstract figures 15A-15C paragraphs [0072] - [0079]	1-23

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" documentwhich may throw doubts on priority claim(s) orwhich is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
1 August 2016	08/08/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Naci , Suphi Umut

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2015/078381

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006056056 Al	16-03-2006	GB 2431312 A	18-04-2007
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US 2014267549 Al	18-09-2014	US 2014267549 Al	18-09-2014
		US 2015296177 Al	15-10-2015