Abstract:

A camera control application comprises a processor and a memory configured to cause the processor to, upon receiving a user input, and based on the user input, execute an instance of a first camera control application on a first apparatus and a corresponding instance of a related camera control application on a second apparatus.

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Title: CAMERA CONTROL APPLICATION
Camera Control Application

Technical Field

The present disclosure relates to the field of user interfaces, associated methods, computer programs and apparatus. Certain disclosed aspects/embodiments relate to portable electronic devices, for example so-called hand-portable electronic devices which may be hand-held in use (although they may be placed in a cradle in use) and which may include cameras. Such hand-portable electronic devices include so-called Personal Digital Assistants (PDAs), cameras, mobile phones, smartphones and tablet PCs.

Background

Photography has long been popular, but has become particularly so now that digital cameras permit images to be captured and viewed without the time and cost needed to provide and process celluloid film.

Digital cameras can be manufactured cheaply and made small in size, and they are now included in many diverse types of electronic equipment, for example in mobile telephones, PDAs, personal computers, television sets (e.g. so-called 'smart TVs') and children's toys. However, not all electronic devices contain a camera, and even when a camera is present the specifications and therefore the images that can be captured vary hugely. For example, a high-end Digital Single Lens Reflex (DSLR) camera is typically very large, very heavy, and very expensive, whilst the small camera typically embedded into a mobile telephone is typically very small, very light and comparatively cheap to produce. However, the physical and functional limitations of the phone camera commonly result in it producing images that are highly inferior in quality to similar scenes captured by the DSLR camera.

Summary
In a first example there is provided an apparatus comprising: at least one processor; and at least one memory including computer program code, the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus to perform at least the following: receive a user input; and based on the user input, provide an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus.

In a second example there is provided a method comprising: receiving a user input; and based on the user input, providing an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus.

In a third example there is provided a computer program configured to provide computer program code for at least the following: receiving a user input; and based on the user input, providing an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus.

In a fourth example there is provided an apparatus, the apparatus comprising: means for receiving a user input; and means for providing, based on the user input, an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus.

The above summary is intended to be merely exemplary and non-limiting.

Brief Description of the Figures

A description is now given, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 illustrates an example apparatus;
Figure 2 illustrates another example apparatus;
Figure 3 illustrates a further example apparatus;
Figure 4 illustrates an example arrangement of apparatuses;
Figure 5 illustrates a further example arrangement of apparatuses;
Figures 6a-6d illustrate an example in which an open instance of a camera control application being moved across three different apparatus/devices;
Figures 7a-7c illustrate another example in which open instance of a camera control application being moved across two different apparatus/devices;
Figures 8a-8g illustrate different examples of ways in which an open instance of an application may move from one apparatus/device to another apparatus/device;
Figure 9 illustrates a flowchart according to an example method; and
Figure 10 illustrates schematically an example computer readable medium providing a program.

Detailed Description of Examples

Electronic apparatuses/devices are often configured to run one or more applications. The same application may be run on different apparatus, possibly at the same time. For example, an office may contain several desktop computers which may all run the same word processing application at the same time. The application may be stored on a remote server and accessed by the different apparatus/devices, or the application may be locally stored for use on each individual desktop computer.

In another case, there may be equivalent applications which have substantially the same functionality, and which may also run on different apparatus/devices. Such equivalent applications may, for example, be the word processing applications Microsoft Word, WordPerfect, and Open Office Writer. These three applications can be considered to be equivalent in the sense that they provide a user with substantially the same functionality, but they are in fact different word processing applications.

Further, other applications may share some common functionality while each also having functionality not in common with another application. For example, a spreadsheet application and a data plotting application may be considered to share common functionality. These two
applications share some common functionality (for example, being able to organise data in a tabular/cellular format) but each may have their own functionality which is not shared. For example, the spreadsheet application may allow more advanced text-based reports to be generated and the data plotting application may not allow this functionality, but the data plotting application may allow a user to plot data in a more advanced way, for example using mathematical functions and statistical analysis, but the spreadsheet application may not allow this functionality.

One example of an application that may be run on a apparatus/device is a camera application that is used to control a physical camera. Such control may include causing the camera to capture an image, changing the camera's settings (for example its focus, aperture, ISO (i.e. film speed), etc. Where the camera is movable (for example where it is mounted on servos) then the control may include moving the camera. The camera control application may also, or alternatively, cause information to be presented to the user concerning the camera's current state: for example a viewfinder view, or one or more current settings of the camera.

In the case where the application is a camera control application, there may be circumstances in which it is desirable that it is run on a particular apparatus. For example, it may be beneficial to run the application on an apparatus that comprises the camera itself. Not only does this simplify the relationship between the application and the camera in the user's mind (he is controlling the camera locally), but since the image captured by the camera will normally be dependent upon its position (and therefore the position, in this example, of the apparatus comprising the camera), the user can easily access a user interface presented by the camera control application whilst he is holding the camera in order to appropriately position it.

Conversely, it may sometimes be beneficial that the camera control application runs on a device other than the camera.

An example of a use case in which it may be desirable to run the camera control application on a device other than the camera being controlled is when the user is for some reason
unable to immediately access the camera. For example, the user may be composing a photograph in which he is the subject (or one of the subjects) - in this event it would be beneficial for the user to control the camera whilst he is in the correct position for the photograph to be composed (e.g. when he is some distance in front of the camera and probably unable to reach the camera or to easily see its user interface). Alternatively, the user may not be a subject of the composition, but for other reasons may not be able to reach his camera. Examples of this latter scenario would be where the camera has been out of reach of the user in order to capture a better view of a scene (for example when it is mounted on a camera rig and raised too high for the user to reach), or where the camera has been introduced into an environment that is unsafe or undesirable for the user to enter (e.g. underwater, in proximity to a dangerous or easily scared animal, or close to a poisonous or otherwise dangerous object).

Another example use case in which it may be desirable to run the camera control application on a device other than the camera is when the user may have ready access to the camera but prefer not to directly interact with it. For example, the user may wish to avoid disturbing the camera by touching it to instruct it to capture an image (e.g. by depressing a shutter button) because the vibration that he introduces to the camera when touching it may adversely affect the quality of the captured image.

As another example, the user may simply prefer the user interface offered by a device other than the camera. For example, the user may prefer to view the camera's viewfinder view on a device that has a larger or otherwise preferable display than that of the camera, or he may prefer to interact with the camera using a device that has controls that are more accurate or more ergonomic than those provided by the camera, or that are simply not provided by the camera. As an example of the latter case, where the camera is configured to be movable the user may wish to pan the camera back and forth smoothly - a device providing an analogue joystick or other control well suited for this purpose may enable the user to achieve a smoother pan than the controls present on the camera itself (digital push buttons, for example).
It may also provide a benefit to a user of multiple devices if there was a relatively easy and intuitive way to transfer an open instance of an application (which can perform at least one task) such as a camera application from one device/application to another device/application. For instance, closing the first application on the first device, and then manually opening a second, equivalent, application on a second device, may be considered to be cumbersome for a user. If the user were able to, for example, perform a gesture on the touch sensitive screen of one device to transfer the open instance of the application to the second device and then recommence working on the same task/application in the second application/device, then the user may experience a smoother and simpler way of transferring tasks performed using applications between devices.

Figure 1 shows an apparatus 100 comprising a processor 110, memory 120, input I and output O. In this example embodiment only one processor and one memory are shown but it will be appreciated that other embodiments may utilise more than one processor and/or more than one memory (e.g. same or different processor/memory types). The apparatus 100 may be an application specific integrated circuit (ASIC) for a portable electronic device. The apparatus 100 may also be a module for a device, or may be the device itself, wherein the processor 110 is a general purpose CPU and the memory 120 is general purpose memory.

The input I allows for receipt of signalling to the apparatus 100 from further components. The output O allows for onward provision of signalling from the apparatus 100 to further components. In this example embodiment the input I and output O may be part of a connection bus that allows for connection of the apparatus 100 to further components. The processor 110 may be a general purpose processor dedicated to executing/processing information received via the input I in accordance with instructions stored in the form of computer program code on the memory 120. The output signalling generated by such operations from the processor 110 is provided onwards to further components via the output O.

The memory 120 (not necessarily a single memory unit) is a computer readable medium (such as solid state memory, a hard drive, ROM, RAM, Flash or other memory) that stores computer program code. This computer program code stores instructions that are executable
by the processor 110, when the program code is run on the processor 110. The internal
connections between the memory 120 and the processor 110 can be understood to provide
active coupling between the processor 110 and the memory 120 to allow the processor 110
to access the computer program code stored on the memory 120.

In this example embodiment the input I, output O, processor 110 and memory 120 are
electrically connected internally to allow for communication between the respective
components I, O, 110, 120, which in this example are located proximate to one another as an
ASIC. In this way the components I, O, 110, 120 may be integrated in a single chip/circuit for
installation in an electronic device. In other example embodiments, one or more or all of the
components may be located separately (for example, throughout a portable electronic device
such as devices 200, 300, or through a "cloud", and/or may provide/support other
functionality.

One or more examples of the apparatus 100 can be used as a component for another
apparatus as in Figure 2, which shows a variation of apparatus 100 incorporating the
functionality of apparatus 100 over separate components. In other examples the device 200
may comprise apparatus 100 as a module (shown by the optional dashed line box) for a
mobile phone or PDA or audio/video player or the like. Such a module, apparatus or device
may just comprise a suitably configured memory and processor.

The example apparatus/device 200 comprises a display 240 such as, a Liquid Crystal
Display (LCD), e-Ink, or touch-screen user interface. The device 200 is configured such that
it may receive, include, and/or otherwise access data. For example, device 200 comprises a
communications unit 250 (such as a receiver, transmitter, and/or transceiver), in
communication with an antenna 260 for connection to a wireless network and/or a port (not
shown). Device 200 comprises a memory 220 for storing data, which may be received via
antenna 260 or user interface 230. The processor 210 may receive data from the user
interface 230, from the memory 220, or from the communication unit 250. Data may be
output to a user of device 200 via the display device 240, and/or any other output devices
provided with apparatus. The processor 210 may also store the data for later use in the
memory 220. The device contains components connected via communications bus 280.
The communications unit 250 can be, for example, a receiver, transmitter, and/or transceiver, that is in communication with an antenna 260 for connecting to a wireless network and/or a port (not shown) for accepting a physical connection to a network, such that data may be received via one or more types of network. The communications (or data) bus 280 may provide active coupling between the processor 210 and the memory (or storage medium) 220 to allow the processor 210 to access the computer program code stored on the memory 220.

The memory 220 comprises computer program code in the same way as the memory 120 of apparatus 100, but may also comprise other data. The processor 210 may receive data from the user interface 230, from the memory 220, or from the communication unit 250. Regardless of the origin of the data, these data may be outputted to a user of device 200 via the display device 240, and/or any other output devices provided with apparatus. The processor 210 may also store the data for later user in the memory 220.

Device/apparatus 300 shown in Figure 3 may be an electronic device (including a tablet personal computer), a portable electronic device, a portable telecommunications device, or a module for such a device. The apparatus 100 can be provided as a module for device 300, or even as a processor/memory for the device 300 or a processor/memory for a module for such a device 300. The device 300 comprises a processor 385 and a storage medium 390, which are electrically connected by a data bus 380. This data bus 380 can provide an active coupling between the processor 385 and the storage medium 390 to allow the processor 380 to access the computer program code.

The apparatus 100 in Figure 3 is electrically connected to an input/output interface 370 that receives the output from the apparatus 100 and transmits this to the device 300 via data bus 380. Interface 370 can be connected via the data bus 380 to a display 375 (touch-sensitive or otherwise) that provides information from the apparatus 100 to a user. Display 375 can be part of the device 300 or can be separate. The device 300 also comprises a processor 385 that is configured for general control of the apparatus 100 as well as the device 300 by
providing signalling to, and receiving signalling from, other device components to manage their operation.

The storage medium 390 is configured to store computer code configured to perform, control or enable the operation of the apparatus 100. The storage medium 390 may be configured to store settings for the other device components. The processor 385 may access the storage medium 390 to retrieve the component settings in order to manage the operation of the other device components. The storage medium 390 may be a temporary storage medium such as a volatile random access memory. The storage medium 390 may also be a permanent storage medium such as a hard disk drive, a flash memory, or a non-volatile random access memory. The storage medium 390 could be composed of different combinations of the same or different memory types.

Figure 4 illustrates an arrangement of two apparatuses 400, 410 according to example embodiments. The apparatuses 400, 410 are in communication with one another as shown by the solid line between them. A first one of the apparatuses 400 is in communication with a camera 420 as illustrated by the solid line between them. In some embodiments the second of the apparatuses 410 may also be in communication with the camera device, but in other embodiments it may not be - the line drawn between the second apparatus 410 and the camera 420 is therefore drawn dashed. Where the second apparatus 410 is not in communication directly with the camera 420, it may still be able to send and/or receive data to/from the camera 420 via the first device 400. The communication between the apparatuses 400, 410 themselves and with the camera 420 may be effected over any suitable means. For example, the communication may be effected over a direct cable connection (e.g. Universal Serial Bus, USB) with suitable interfaces. Alternatively, the connection may be wireless, for example over Bluetooth, WiFi, or any other suitable wireless communication. The connections may be direct point-to-point, as shown in Figure 4, or they may be made indirectly, for example over the Internet or through a different network. The communications may be effected using WebRTC (Web Real Time Communication).

Each of the apparatuses 400, 410, 420 is capable of running at least one application that controls the camera 420. These applications may be identical copies of the same application,
or they may be different applications that have at least some camera control functionality in common between them. Each of the apparatuses 400, 410, 420 may be running an operating system that is the same or different to the operating systems of the other apparatuses, and an equivalent application could be run on each device in either case.

Camera control applications may be considered "at least related" to each other on the basis that they are either equivalent (i.e. they provide substantially similar functionality), or identical. The two applications may be identical in the sense that they are different instances of the same application, or may be identical in the sense that they are the same instance of an application, with that single instance being transferrable between apparatuses.

Consider a further example. In this example apparatuses 400 and 410 can each access and run a different camera control application. The camera control application runnable by apparatus 400 includes functions for displaying a viewfinder view of the camera, causing the camera 420 to capture an image, and switching the camera flash on and off. The camera control application runnable by apparatus 410 includes equivalent functions for displaying a viewfinder view and causing the camera 420 to capture an image, but it does not include a function for switching the flash on and off. Apparatus 400 is in this case capable of running an application with a common level of functionality to that provided by the application runnable on the apparatus 410. The common level of functionality in this example is that a viewfinder view may be presented and the camera may be caused to capture an image. The common functionality may also be considered to be any menu options 408, 468 with the same common functionality. For example, the application 462 may also allow for the functionality to change camera settings. The user interface may be different for the two applications without affecting the fact that they provide a common level of underlying camera control functionality and therefore provide substantially similar functionality making them equivalent. It will be appreciated that there are many other ways in which the appearance may be different between two open instances of two applications, such as having different colour schemes, different fonts, different display sizes and form factors, different style buttons/icons/menu systems, and many other possible factors.
The apparatuses 400 and 410 in Figure 4 may be independently operable; that is, they can be used as standalone devices without connection to another device, such as a server, and provide the functionality of their camera control applications. However, they may instead be communication with an external remote server. Any number of apparatuses may be in communication with the remote server, which may be either a cloud or a physical server. The communication with the remote server may be a two way communication for each apparatus 400, 410, 420. Each apparatus 400, 410, 420 may be capable of running one or more applications.

Where a remote server is present, related camera control applications may be provided for use on various different apparatuses by communication with the remote server. That is, a camera control application may be available from the server, and different versions of this application may be available, each version being more suited for use on a particular apparatus. For example, a version with a relatively large functionality may be suitable for use on a laptop or desktop computer, a version with reduced functionality may be suitable for use on a mobile phone or smartphone, and a version with particular functionality suitable for use on a digital camera may also be available.

As another example, the same camera control application may be provided for use on various different apparatuses by communication with the remote server. Thus, applications are not necessarily located locally just on the apparatuses that will run them, but may need to communicate with the remote server in order to run the application. In certain embodiments, the application can be considered to be distributed between the apparatus and the server, with parts of the application on the respective device/server needing to be run together to perform the tasks provided by the application.

The server may provide, for example, the same, or related applications, for use by allowing for download of the application from the server, so that after the download, the apparatus can run the stored application as a stand-alone device, without further communication with the server. The apparatus may also be able to communicate further with the server, for example to download and store an updated version of the application. Provided for use may also be taken to mean that the application is stored and running on the remote server, and that the
apparatuses provided with that application for use are using that application which is running on the server. In this case, a user of the device may not be able to use the application if communication with the server is interrupted or terminated. In other examples, there may be more than one remote server, with which one or more devices is/are in communication. To say that an application is "running" on an apparatus may therefore mean that it is running on a remote server but accessible to the apparatus.

Figure 5 illustrates a different arrangement of two apparatuses 500, 510 that is similar to that of Figure 4 except that the camera 520 forms part of the first apparatus 500. The first 500 and second 510 apparatuses are again in communication with one another.

Figures 6a - 6d illustrate an example embodiment of three apparatuses: a portable electronic device such as a tablet computer 600, a mobile telephone 610 and a digital camera 620. These three apparatuses have been chosen merely by way of example - apparatuses 600 and 610 may be any suitable apparatus capable of running applications, and apparatus 620 may be any suitable apparatus that either comprises a camera or is in communication with a camera such that it can control the camera. "Controlling" the camera may comprise sending data to the camera that causes the camera to perform a function (such as capture a static image or video, move the camera, or change a camera setting) and/or receive data from the camera (such as a viewfinder view, captured static image or video data, or data representing the camera's current settings).

In this example, all three apparatuses 600, 610, 620 are in communication with one another (for example they are all attached to a common network). Not all three apparatuses need be present or even exist, for example only apparatuses 600 and 620 might be present in the absence of apparatus 610. Similarly, other apparatus (not illustrated) may be present and also in communication with the apparatuses shown.

In Figure 6a the digital camera 620 comprises a display 625 and a shutter button 626. The camera 620 is currently pointed towards a snow scene which is displayed in a viewfinder view on the camera's display 625. Were the user to now press the shutter button 626, an
image or video of the snow scene would be captured by the camera 620, in accordance with the current settings of the camera.

There may be transient data associated with the camera control application running on the camera 620. For example, the current zoom level, the current flash settings, the current position/status of navigation through a menu system provided by the camera control application. Were the camera control application on the camera 620 to be closed (e.g. by turning the camera off, or by otherwise exiting the application) then such data would not be preserved until the application was next loaded and can therefore be considered to be transient content. Transient content may be thought of as data which is not normally saved upon an application being closed, that is, transient content would not normally persist between instances of an application being opened. In contrast, the data that would persist (e.g. images that have been captured and stored to the camera's memory) can be considered to be data content as (opposed to transient content).

In the example shown in Figure 6a, the user has chosen a digital zoom setting that influences how the image (when captured) will be cropped, and also dictates the area of the currently sensed image that is displayed in the viewfinder view. The user has also selected to activate the flash and an indication 607 of this setting is shown overlaying the viewfinder view.

The interface displayed by the camera's 620 camera control application may also show other features such as previously captured images. These images form data content. Data content may be considered persistent, in that it will always be available to a user upon the user opening the camera control application. The camera control application itself may also display elements such as menus and buttons/icons and such elements would not be considered to be data content. Each time the camera control application is opened, the images, menus, buttons and text will be presented and/or available to the user regardless of any transient content such as the current view through the viewfinder or non-persistent settings. Also, different camera control applications may have different menus and/or buttons/icons and may still allow the user to view the same data content, e.g. the same previously captured images.
Other examples of data content include text (such as text saved in a word processing document, e-mail, database, text-based message or contacts list); numbers (such as entries made in a spreadsheet, database or data package, or contacts list); fields (such as entries made in a database, text entered into a field in a website); cells (such as spreadsheet entries); image content (such as photographs, maps, drawings, presentation slide content, and images in games); audio content (such as music, songs, voice recordings and game soundtracks); video content (such as video cuts in games, and movies); and webpage content (text, images and hyperlinks). It will be appreciated that this list of examples is not exhaustive. It will also be appreciated that, upon opening a previously closed application, such data content is usually presented and/or available to the user.

In the example shown in Figure 6a, the flash setting and digital zoom level are transient content.

At this point the tablet 600 and mobile phone 610 do not necessarily show any open applications on their respective displays 605, 615. It may be that there is camera control application currently running on these devices. Alternatively, there may be a camera control application running, but it is 'minimised' or hidden so that although it is running, it is not currently displayed. Each of the displays 605, 615 may be deactivated, or may be displaying content such as for example a Screensaver or homepage. However, each of apparatuses 600 and 610 have access to and can run camera control applications that are at least related to the camera control application of apparatuses 620, in that they may be the same application (for example, all three apparatuses 600, 610, 620 may have the same camera control application) or they may have camera control applications with a common level of functionality (for example, the camera control application of apparatus 600 may be one particular camera control application, whereas device 610 may have a different camera control application and apparatus 620 may have a plurality of other camera control applications. These applications all have a common level of functionality.)

In this example, the camera control applications are provided for use on apparatuses 600, 610, 620 by accessing respective memories located with each apparatus. For example, a
first camera control application is located in a memory (not shown) of the tablet 600, a second camera control application is located in a memory (not shown) of the phone 610, and a third camera control application is located in a memory (not shown) of the camera 620.

Figure 6b illustrates the user's finger 630 part way through a left slide operation. In response to the left swipe operation, the UI of the camera control application on the camera 620 has been translated to the left of the camera's display 625 and is shown having partially exited the display on the left hand side. Substantially simultaneously, the UI of the camera control application of the tablet is shown entering the tablet's display 605 from the right hand side.

In Figure 6b, a user 630 is providing a user input which is being received by the second device. In this example the user is providing a slide gesture to the touch-sensitive screen of the computer 630. Other user inputs may be used in place of the slide gesture, and some examples of suitable user inputs will later be described in more detail.

Based on this user input, as shown in Figure 6b, the open instance of the camera control application of the camera 620 is provided as a corresponding open instance of an at least related (camera control) application on the tablet 600. That is, due to the user input, the camera control application which was open on the camera 600 now appears as an open instance of the camera control application on the tablet's display 605. In this example, the same data content and the same transient content (e.g. digital zoom level and flash setting 607) are provided on the tablet 600 as were provided in the camera control application on the camera 620.

In this example shown in Figure 6b, the open instance of the camera's camera control application is progressively removed from the display 605 of the camera 620, and the corresponding open instance of the (at least related) camera control application is progressively displayed on the tablet 600 as the user moves his/her finger progressively from the right to the left. The progressive removal/display occurs in this example in the direction of the user input; that is, the user is sliding his finger 634 from right to left and the apparent transition of the open instance of the application from the camera 620 on the right to the tablet 600 on the left is in the same direction, right to left. The term "apparent transition" is
used because, in this example, the open instance of the first application is not actually moved from the first to the second apparatus. The transient content and the data content are synchronised between the two apparatuses 600, 620, and the open instance of the camera control application on the tablet 600 is configured to use the transient content and data content to display an application to the user which shows common features to that seen on the camera 620 before the user input. In this example, it may be considered that the local state (including the transient content and the data content) is replicated on the tablet 600 as in the camera 620, giving the appearance that the open instance of the camera's camera control application has been transferred as the open instance of the tablet's camera control application.

It can also be seen that the difference in form factor is accounted for in this example. The form factor of the displays of the camera 620 and tablet 600 are different, and so the form factor of the displayed content is altered accordingly so that the open instance of the camera control application displayed on the camera 620 displays the same viewfinder view as the open instance of the camera control application displayed on the tablet 600. Note also that in this example the tablet lacks a physical shutter key like that 626 present on the camera 620. The UI of the camera control application on the tablet 600 therefore includes a virtual shutter button 606 that was not present in the UI of the camera control application on the camera 620.

It will be appreciated that in other examples, the form factor of the displayed open application may not be preserved upon displaying another open instance of a user application, and the form factor may be chosen to best suit the data being displayed. For example, video shown in widescreen display on a landscape-oriented monitor of a laptop may maintain the form factor of the widescreen if subsequently opened on a mobile telephone with a portrait-oriented screen; the other regions of the mobile phone screen not showing the video may be black or contain other options or text. Rotating the mobile phone so that the display is landscape oriented may cause the movie to be rotated correspondingly and displayed in landscape on the landscape oriented display of the mobile phone.
The two apparatuses 600 and 620 not only have different form factors, but also have different display sizes. The open instance of the second application on the second apparatus is resized in comparison with the open instance of the first application on the first apparatus, to accommodate the larger screen of the second apparatus with respect to the first apparatus.

The two apparatuses 600, 630, may also have different display resolutions and/or different display colour schemes (for example, one apparatus may have a black and white screen, and another apparatus may have a colour screen).

The apparent transition of the camera control application being progressively removed from display from the camera 620 and progressively displayed on the tablet 620 may be dependent on a speed-dependent characteristic of the user input, it may be envisaged that if the user makes a faster slide gesture, that the apparent transition would be relatively faster. Similarly, if the user were to make a relatively slow slide gesture, then the apparent transition may be relatively slower. Also, for example, the user may be able to begin to make a slide gesture, then (say, if they changed their mind about wanting to make the transition) they could reverse their input and move the open instance of the application back on to the original apparatus.

The provision of open instances of user applications is not limited to being between two apparatuses only. Figures 6d shows an alternative to Figure 6b in which the user 630 is providing a user input on the camera 620 that is a left to right slide gesture rather than the right to left slide gesture of Figure 6b. In response, the camera control application is transitioned not to the left to the tablet 600, but instead to the right to the mobile phone 610. Note that a physical button on the mobile phone 600 has been repurposed as a shutter key 616, so a virtual shutter key like that 606 of the tablet's 600 is not required. Again in this example, the same data content and the same transient content are provided on the mobile phone as were provided in the camera 620 (and indeed the tablet 600). Therefore, the user need not zoom in again, or re-set the flash mode (note the flash indicator 617 in the UI of the phone's 610 camera control application as this transient content has been preserved during the transition.
In the example embodiment shown in Figures 6a-6d, when the camera control application is transitioned to a new apparatus, it ceases to be displayed on the old apparatus. However, in other examples the open instance of the camera control application remains displayed on the old apparatus after the corresponding open instance of the camera control application new apparatus. This remaining display may be as an image, to remind the user what has been displayed on the old apparatus but which does not allow full interaction as previously. In other examples, the remaining display may be the camera control application for that apparatus which is still running and with which the user may still be able to fully interact. It will be appreciated that the application on the old apparatus may close after the apparent transfer to the new apparatus. Of course, it may instead remain open and be updated, synchronised with changes made on the apparatus with which the user is interacting.

For example, it may be envisaged that while the user can make inputs and manipulate the open camera control application on the phone 610, he or she may also be able to make inputs and manipulate the open application on the camera 620. Just because the open instance has been provided on a further apparatus does not necessarily exclude the ability of the open application to still be running on the initial apparatus. Any inputs made on the new apparatus may be received by the open instance of the camera control application on the old; however, on-going synchronisation of the transient content of the applications on the apparatuses may mean that the effect of such inputs at the old apparatus is propagated into the application running on the new apparatus. In such cases one of the apparatuses, or a remote server, can act as a controller to control the synchronisation between the multiple apparatuses, or more than one of the apparatuses can act in cooperation to control the synchronisation.

In the above example, the gestures can be considered to be push gestures, in that the corresponding open instance is seen to be pushed onto a new apparatus from the apparatus which receives the gesture input. Of course, in other examples, the (gesture) input could be a pull gesture input from a new apparatus to cause the corresponding open instance to be provided to the new apparatus from an old apparatus on which it is currently running.
It may be the case that two apparatuses are configured to form a (e.g. private) sharing network to allow for the provision of corresponding open instances of an at least related application as described herein.

Figures 7a - 7c illustrate another example embodiment of two apparatuses in use: a tablet 700 and a camera 720. The apparatuses 700, 720 in are each able to run a camera control application, and may (otherwise) operate independently, that is, each may not require any connection to another apparatus or to the internet or other network in order to operate (although such connections to other apparatuses and/or to a network and/or the internet may be possible, and required to allow for the corresponding open instances of a related application). The two apparatuses 700, 720 may also each be able to run a plurality of applications each providing respective functionalities. For example, the apparatus 700 may have calling capabilities, be able to send/receive SMS, MMS and video messages, send/receive e-mails, play games, and access social media sites and applications. The apparatus 720 may be able to run productivity applications (word processing, spreadsheets, databases, presentation applications) and image processing applications, and play games - the fact that it is a camera does not preclude such additional functionality.

Figure 7a shows the camera 720 displaying an open instance of a camera control application on its display 725. In Figure 7a, the user has set the digital zoom to a particular level and has activated the flash, as indicated by the flash indicator 727 that is displayed overlaying the viewfinder view in the camera control application’s UI on the display 725. The camera 720 comprises a dedicated shutter button.

As previously described in relation to Figures 6a-6d, the open instance of the camera control application contains the transient content of the digital zoom level and current flash setting. The user may decide that he wishes to compose and capture a photo remotely from the camera, for example because he wishes to be present in it. To this end, he may decide to compose and capture the image using his tablet 700 to control the camera 720. Figure 7a shows that there are no open instances of any application displayed on the tablet. However, as previously described in relation to Figures 6a-6d, this does not preclude other examples in which applications and/or other content may be displayed on the tablet's display 705.
The tablet 700 has access to and can run a camera control application that is at least related to that running on the camera 720, in that they may be the same application (for example, both apparatuses 700, 720 may have access to the same camera control application) or they may have camera control applications with a common level of functionality (as described previously). It may be imagined that an apparatus such as tablet 700 may have more than one suitable camera control application available for use. All these applications will have a common level of functionality in that they can be used for controlling camera 720. In this example, the camera control applications are provided for use on apparatuses 700, 720 by accessing the respective memories located in each apparatus. It may be in other examples that one or more apparatus accesses the required software from a remote server or cloud as has previously been described.

In Figure 7b, a user 730 is providing a user input which is being received by the tablet 700. In this example the user is providing a slide gesture to the touch-sensitive display 705 of the tablet 700. Other user inputs may be used in place of the slide gesture, and some examples of suitable user inputs are described later in more detail.

Based on this user input, as shown in Figures 7b and 7c, the open instance of the camera control application running of the camera 720 is provided as a corresponding open instance of an at least related (camera control) application on the tablet 700. Due to the user input, the data content and transient content in the camera control application which was open on the camera 720 now appears in an open instance of the camera control application on the tablet 700. The same data content and the same transient content (e.g. the digital zoom level and the camera flash indicator 727) are provided on the tablet 700 as were provided in the camera control application running on the camera 720.

Figure 7c shows that the digital zoom level and the camera flash setting (shown by indicator 707) have been preserved after the camera control application has been apparently translated to the tablet 700. Thus, the user need not be concerned with re-establishing these settings.
In this example shown in Figure 7b, the open instance of the camera control application running on the camera 720 is progressively removed from the display 725 of the camera 720, and the corresponding instance of the camera control application running on the tablet 700 is progressively displayed on the tablet's display 705. The progressive removal/display occurs in the direction of the user input; that is, the user is sliding his finger from right to left and the apparent transition of the open instance of the camera control application from camera 720 on the right to the tablet 700 to the left is in the same direction, right to left. Of course, the gesture input may be provided on the tablet 700 by pressing a particular key, or by using the display if it allows for touch input.

In the example illustrated in Figures 7a-7c the user has caused a corresponding instance of the application running on the camera 720 to be displayed on the tablet 700 using a gesture that is performed on the tablet 700 (a "pull" gesture, in the sense that the instance of the application is "pulled" to the apparatus that receives the gesture). This is in contrast to the example illustrated in Figures 6a-6c in which the corresponding instance of the application was caused to be opened on the tablet 600 in response to a gesture received at the camera 620 (a "push" gesture, in the sense that the application is "pushed" from the apparatus that receives the gesture to another apparatus). Other than the push/pull nature of the gesture, these examples may function similarly.

In the examples presented so far, the instance of the camera control application has been transferred from a camera to a non-camera apparatus. However, this is purely by way of example. The control application may be instead (or subsequently) transferred between apparatuses that are both cameras, or of which neither are cameras.

Figures 8a-8g illustrate two exemplary apparatuses 800, 850, and each Figure 8a-8g represents a different way in which the open instance of a first application may be progressively removed from display from a first apparatus 800 and a corresponding open instance of an at least related second application may be progressively displayed on the second apparatus 850. Of course, the corresponding instance may be provided instantly, rather than progressively linked with the progressive nature of a particular user input. Thus,
pressing a key, for example, on the first apparatus may instantly provide the corresponding open instance on the second apparatus.

Figure 8a shows that the user 854 is providing a slide gesture 856 in a diagonal direction from top right to bottom left of the screen of the second apparatus 850. The open instance of the first application 802 is progressively removed from display from the first apparatus 800 and the corresponding open instance of an at least related application 852 is progressively displayed on the second apparatus 850. The user may, in other examples, provide a slide gesture in any direction, for example from left to right, right to left, diagonally, from top to bottom, or from bottom to top. The open instance of the at least related application is progressively displayed on the second apparatus 850 in a direction corresponding to the direction of the user input made. In other embodiments the direction could be inverse to the direction of user input, for example, a left to right input made on the first apparatus (or on the second apparatus) may display the corresponding instance from right to left on the second apparatus. The direction of the user input can be an arbitrary direction which the user may select based on his or her observation of the relative position of the apparatuses being used. Thus, in a case where the transitional effect from the open instance of a first application appearing to as a corresponding open instance of an at least related application is a directional one, the apparatuses need not necessarily know their position relative to the other apparatuses. As a further example, the user, when providing a slide gesture input in any direction, may change their mind and be able to reverse the direction of the slide to provide the open instance of the first application back on the original first apparatus. The user may also be able to 'wag' their sliding finger back and forth and create the impression of the open instances of the first application and the at least related application wagging back and forth between the two apparatuses.

Figure 8b shows that a user is providing a "pinch" gesture 806 on the screen of the first apparatus 800. The open instance of the first application 804 is progressively removed from display from the first apparatus 800 and may appear as if being pinched up, similarly to a cloth being pinched in the middle and being lifted up from a surface. The corresponding open instance of an at least related application 858 is progressively displayed on the second apparatus 850, in this example as if pooling out 860 from the centre of the apparatus's
display. Other similar transition effects may be achieved, for example, the user may be able
to pinch (that is, slide two fingers or a finger a thumb together on the screen of the first
apparatus 800) anywhere on the screen, not just in the centre. The effect seen on the screen
of the second apparatus 850 may be the pooling out of the displayed open instance of the
application on the second apparatus from a corresponding location on the second
apparatus's screen.

Figure 8c shows that that a user is providing a "swirl" (which may also be called a "whirl")
gesture 810 on the screen of the first apparatus 800. The swirl gesture may be a spiral or
otherwise arcuate gesture with which the user notionally 'swirls' or 'stirs' the content on the
display. The open instance of the first application 806 is progressively removed from display
from the first apparatus 800 and appears as if being stirred up/swirled around e.g. as if in a
whirlpool. The corresponding open instance of an at least related application 862 is
progressively displayed on the second apparatus 850, in this example as if unswirling 864
from the centre of the apparatus's display.

Figure 8d shows that the user 812 is providing a slide gesture 814 from left to right on the
display of the first apparatus 814 as if to push the screen over to the neighbouring apparatus
850. The open instance of the first application 816 is progressively removed from display
from the first apparatus 800 and the corresponding open instance of an at least related
application 866 is progressively displayed on the second apparatus 850. The user may, in
other examples, provide a push slide gesture in any direction, for example from left to right,
right to left, diagonally, from top to bottom, or from bottom to top. The open instance of the at
least related application is progressively displayed on the second apparatus 850 in a
direction corresponding to the direction of the user input made 814.

The effects provided due to the user slide inputs 856, 814 made in Figures 8a and 8d may, in
other examples, be provided by other combinations of user inputs. For example, it may be
that to distinguish a slide intended to provide an open instance of an application on a second
apparatus from a slide intended to, for example, move to a different home screen on the
same apparatus, the user may make the slide all the way across a screen from edge to edge,
or possibly from outside one edge of the display to the centre of the display. Such a gesture
may be considered to be made outside an application's user interface, since the slide originated from outside one edge of the display of the apparatus running the application. Such a slide gesture may be detected by touch sensors located outside the periphery of the touch sensitive screen (e.g. on one or more edges of the apparatus) and the 'edge' touch sensors may be used to detect the start of the slide user input. As another example, any slide/swipe user input which is detected by the touch sensitive screen as beginning at the outermost touch sensitive area of the touch sensitive display may be extrapolated as having started outside the periphery of the touch sensitive area and be recognised as a user input for providing an open instance of an application on a second apparatus.

In other examples, the user may be required to press and hold for a predetermined period of time before sliding to indicate to the apparatus what the intended effect of the input is (to provide an open instance of an application on a second apparatus). Other possible inputs include, for example, a tap-and-slide, press and slide, a flick, press and flick, a multiple tap and slide or a multi finger slide. Another example may be that an apparatus 800 comprising an accelerometer and/or gyroscope may allow the user to make such an input by tilting the apparatus from left to right (or in another direction). This tilting action may be performed after a prior input priming the apparatus that the user wishes to open a corresponding application on another apparatus. Other inputs are possible as will be appreciated.

It will be appreciated that some form of (e.g. private) sharing network needs to be available between the apparatuses. This can be done prior to receipt of the user input to provide the corresponding open instance, or can be initiated upon the determination that such an input has been received, e.g. after detecting the particular user input, the apparatus which has received the user input may look for apparatuses with which it can form a network to allow for the provision of the corresponding open instance. Such networks may be preconfigured, or the apparatus may ask the user to identify/confirm the apparatus which will provide the corresponding open instance of the at least related application.

It may be that the source (first) apparatus and/or the recipient (second) apparatus may be identified due to the push/pull gesture input made by a user. Other examples of ways of identifying the apparatuses to be involved in providing open instances of applications due to
user inputs include that the identity of each apparatus has been previously defined. This may be by a user changing a setting in a menu, or by the manufacturers pre-defining the identity. Another example is that nearby apparatuses may be able to determine their relative distances from each other, and the apparatus determined to be the closest to the apparatus being interacted with by a user in the one which is involved in providing a (corresponding) open instance of an application. A further example is that nearby apparatuses may be able to determine their relative locations from each other, and the direction of the user input made may indicate the other apparatus to be used, for example, indicated by the direction in which the user input is made (e.g. a swipe made in the direction of the recipient apparatus). A further example is in the case of a pull (slide) user input, all the apparatuses available except for the source apparatus (on which the input is being made) may be in a standby state waiting for a user input to instruct them to open a corresponding instance of an at least related application (by an open application being pulled towards that apparatus).

Figure 8e shows that the user is providing a voice input 814 "Go to tablet" instructing the open instance of the first application 816 to be (progressively) removed from display from the first apparatus 800 and the corresponding open instance of an at least related application 870 to be (progressively) displayed on the second apparatus 850. In this example the apparatus 800 is capable of voice recognition. The user may be able to pre-set names for his or her apparatuses, such as "tablet", "my phone", "screen two", so that the apparatus 800 receiving the user voice input knows which other apparatus (in the network) to instruct to provide an open instance of an application containing the data and transient content. In other examples, the user may be able to provide a 'pull' voice input such as "Switch from my phone" or "Take from desktop" instructing the open instance of a first application to be (progressively) removed from display from the first apparatus (the phone or desktop) and the corresponding open instance of an at least related application to be (progressively) displayed on the second apparatus.

Figure 8f shows that the user has a key 880 available on a keyboard of the second apparatus 850, which when pressed by the user 878 instructs the open instance of the first application 820 to be removed from display 822 from the first apparatus 800 and the corresponding open instance of an at least related application 874 to be progressively
displayed 876 on the second apparatus 850. In this example, the user may be able to
configure a key 880 or a particular combination of keys for this purpose. It will be appreciated
that the key 880 illustrated in Figure 8f is representative of an already existing key or
combination of keys configured for the purpose of providing a corresponding open instance
of a related application from an open instance of an application on another apparatus
(whether progressively or instantly)

Figure 8g shows that the user is providing a slide gesture 884 by using a peripheral
apparatus, in this case, a mouse 888. The user is able to slide the mouse pointer 886 from
left to right across the display of the second apparatus 850 when using, for example, a
right/left click together with the associated physical movement of the mouse 888 i.e.
activation input. The open instance of the first application 824 is then progressively removed
from display 826 from the first apparatus 800 and the corresponding open instance of an at
least related application 882 is progressively displayed on the second apparatus 850 due to
this user input with the mouse 888. The open instance of the at least related application 882
is progressively displayed on the second apparatus 850 in a direction corresponding to the
direction of the user input made 884. The mouse pointer 886 may be able to provide the
activation input by sliding along any region of the screen. For example, one region of the
screen may be configured to accept a press and slide motion in that region as an input for
opening a corresponding open instance of an at least related application 882 while removing
826 an open instance 824 from a first apparatus 800. It will be appreciated that such an input
from a peripheral apparatus may also be made, for example, via a wand, a pointing stick, a
touchpad, a stylus and pad, a joystick or a remote controller.

In the examples where an open instance of a first application is provided as a corresponding
open instance of an at least related application by the first application being progressively
removed while the at least related application is progressively displayed, the progressions
(which give the impression of a transition from one to the other apparatus) of the two
applications may be matched. By being matched, it is meant that if, for example, one quarter
of the first application is removed by a user input, then correspondingly one quarter of the at
least related application is displayed on the second apparatus; similarly as one third of the
first application is removed, then one third of the at least related application is displayed on
the second apparatus. The speed at which the apparent transition takes place also required that the speed of progressive removal of the open application on the first apparatus is matched by the speed of progressive display of the at least related application on the second apparatus. This progressive apparent transition can take into account any differences in form factor or size of the different displays, as previously described.

Figure 9 shows a flow diagram illustrating the steps of receiving a user input 902; and based on the user input, based on the user input, providing 904 an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus.

Figure 10 illustrates schematically a computer/processor readable medium 1000 providing a program according to an embodiment. In this example, the computer/processor readable medium is a disc such as a Digital Versatile Disc (DVD) or a Compact Disc (CD). In other embodiments, the computer readable medium may be any medium that has been programmed in such a way as to carry out an inventive function. The computer program code may be distributed between the multiple memories of the same type, or multiple memories of a different type, such as ROM, RAM, flash, hard disk, solid state, etc.

The apparatus shown in the above embodiments may be a portable electronic apparatus, a laptop computer, a mobile phone, a Smartphone, a tablet computer, a personal digital assistant, a digital camera, a watch, a non-portable electronic apparatus, a desktop computer, a monitor, a server, or a module/circuitry for one or more of the same.

The portable electronic apparatus according to one or more disclosed aspects/embodiments may provide one or more audio/text/video communication functions (e.g. tele-communication, video-communication, and/or text transmission (Short Message Service (SMS)/ Multimedia Message Service (MMS)/emailing) functions), interactive/non-interactive viewing functions (e.g. web-browsing, navigation, TV/program viewing functions), music recording/playing functions (e.g. MP3 or other format and/or (FM/AM) radio broadcast recording/playing), downloading/sending of data functions, image capture function (e.g. using a (e.g. in-built) digital camera), and gaming functions.
Any mentioned device/apparatus/server and/or other features of particular mentioned apparatus/apparatus/server may be provided by apparatus arranged such that they become configured to carry out the desired operations only when enabled, e.g. switched on, or the like. In such cases, they may not necessarily have the appropriate software loaded into the active memory in the non-enabled (e.g. switched off state) and only load the appropriate software in the enabled (e.g. on state). The apparatus may comprise hardware circuitry and/or firmware. The apparatus may comprise software loaded onto memory. Such software/computer programs may be recorded on the same memory/processor/functional units and/or on one or more memories/processors/ functional units.

In some embodiments, a particular mentioned device/apparatus/server may be pre-programmed with the appropriate software to carry out desired operations, and wherein the appropriate software can be enabled for use by a user downloading a "key", for example, to unlock/enable the software and its associated functionality. Advantages associated with such embodiments can include a reduced requirement to download data when further functionality is required for an apparatus, and this can be useful in examples where a apparatus is perceived to have sufficient capacity to store such pre-programmed software for functionality that may not be enabled by a user.

Any mentioned apparatus/circuitry/elements/processor may have other functions in addition to the mentioned functions, and that these functions may be performed by the same apparatus/circuitry/elements/processor. One or more disclosed aspects may encompass the electronic distribution of associated computer programs and computer programs (which may be source/transport encoded) recorded on an appropriate carrier (e.g. memory, signal).

Any "computer" described herein can comprise a collection of one or more individual processors/processing elements that may or may not be located on the same circuit board, or the same region/position of a circuit board or even the same apparatus. In some embodiments one or more of any mentioned processors may be distributed over a plurality of apparatuses. The same or different processor/processing elements may perform one or more functions described herein.
With reference to any discussion of any mentioned computer and/or processor and memory (e.g. including ROM, CD-ROM etc), these may comprise a computer processor, Application Specific Integrated Circuit (ASIC), field-programmable gate array (FPGA), and/or other hardware components that have been programmed in such a way to carry out the inventive function.

The applicant hereby discloses in isolation each individual feature described herein and any combination of two or more such features, to the extent that such features or combinations are capable of being carried out based on the present specification as a whole, in the light of the common general knowledge of a person skilled in the art, irrespective of whether such features or combinations of features solve any problems disclosed herein, and without limitation to the scope of the claims. The applicant indicates that the disclosed aspects/embodiments may consist of any such individual feature or combination of features.

In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the disclosure.

While there have been shown and described and pointed out fundamental novel features as applied to preferred embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the apparatuses and methods described may be made by those skilled in the art without departing from the spirit of the disclosure. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the disclosure. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiments may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. Furthermore, in the claims means-plus-function clauses are intended to cover the structures described herein as performing the recited function and not only structural equivalents, but also equivalent structures.
Claims

1. An apparatus comprising:
   at least one processor; and
   at least one memory including computer program code,
   the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus to perform at least the following:
   receive a user input; and
   based on the user input, provide an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus.

2. The apparatus of claim 1, wherein the first and at least related camera control applications are configured to control a camera comprised by the first apparatus.

3. The apparatus of claim 1 or claim 2, comprising the first apparatus.

4. The apparatus of claim 1 or claim 2, comprising the second apparatus.

5. The apparatus of any preceding claim where the second apparatus is selected from a plurality of apparatuses based on the user input.

6. The apparatus of claim 5, wherein the second apparatus is selected based upon a direction of the user input, wherein the direction corresponds to the relative locations of the first and second apparatuses.

7. The apparatus of claim 5, wherein the second apparatus is selected based upon the user input being received at the second device.

8. The apparatus of any preceding claim, wherein the user input is received by the first apparatus.
9. The apparatus of any of claims 1 to 7, wherein the user input is received by the second apparatus,

10. The apparatus of any preceding claim, wherein the apparatus is configured such that the open instance of a first application is progressively removed from display from the first apparatus and the corresponding open instance of the at least related application is progressively displayed on the second apparatus based on the user input.

11. The apparatus of any preceding claim, wherein the apparatus is configured such that the proportion of the corresponding open instance of the at least related camera control application is progressively displayed on the second apparatus based on at least a characteristic of the received user input.

12. The apparatus of claim 11, wherein the apparatus is configured such that the corresponding open instance of the at least related camera control application is progressively displayed on the second apparatus in a direction corresponding to a direction of the received user input.

13. The apparatus of claim 11 or claim 12, wherein the apparatus is configured such that the proportion of the open instance of the first camera control application is progressively removed from display on the first apparatus and the proportion of the corresponding open instance of the at least related camera control application is correspondingly progressively displayed on the second apparatus based on the at least a characteristic of the user input.

14. The apparatus of any of claims 11 to 13, wherein the characteristic of the user input comprises at least one of: the direction of the user input, the speed of the user input, the extent of the user input, and the reversal of the user input.

15. The apparatus of any preceding claim, wherein the apparatus is configured such that the open instance of the first camera control application remains displayed on the first apparatus after the corresponding open instance of the at least related camera control application is displayed on the second apparatus.
16. The apparatus of any preceding claim, wherein the user input comprises a swipe across a touch-sensitive region of the first apparatus or the second apparatus, the swipe beginning at one edge of the touch sensitive region of the apparatus.

17. The apparatus of any of claims 1 to 15, wherein the user input comprises a swirl gesture.

18. The apparatus any of claims 1 to 15, wherein the user input comprises a voice input.

19. The apparatus any of claims 1 to 15, wherein the user input comprises a combination of one or more of the following gestures made on a touch sensitive display associated with the first or second apparatus: a slide, a slide from one edge of a display, a tap, a multiple tap, a press, a flick, a pinch gesture, and a swirl gesture.

20. The apparatus of any preceding claim, wherein the apparatus is configured to provide a corresponding open instance by providing one or more of the same data content as on the first camera control application on the first apparatus in the at least related camera control application on the second apparatus.

21. The apparatus of any preceding claim, wherein the apparatus is configured to provide a corresponding open instance by providing one or more of the same transient content as on the first camera control application on the first apparatus in the at least related camera control application on the second apparatus.

22. The apparatus of claim 21, wherein the transient content comprises at least one of: a viewfinder view, a digital zoom level, and camera settings.

23. The apparatus of any preceding claim, wherein the first camera control application and the at least related camera control application provide a common level of functionality which is provided in the respective open instances of the first and the at least related application.
24. The apparatus of claim 19, wherein the common level of functionality comprises at least one of presenting to a user a viewfinder view of a camera, causing the camera to capture a static image, causing the camera to capture a video image, and changing a setting of the camera.

25. The apparatus of any preceding claim, wherein the first application and the at least related application are equivalent applications provided using different operating systems of the respective first and second apparatuses.

26. The apparatus of any preceding claim, wherein the first application and the at least related application are provided for use on the respective first and second apparatuses by communication with at least one remote server.

27. The apparatus of any preceding claim, wherein the apparatus is a portable electronic apparatus, a laptop computer, a mobile phone, a smartphone, a tablet computer, a personal digital assistant, a digital camera, a watch, a non-portable electronic apparatus, a desktop computer, a monitor, a server, or a module/circuitry for one or more of the same.

28. The apparatus of any preceding claim wherein a display of the first apparatus and a display of the second apparatus each have one or more of: different display sizes, different display form factors, different display resolutions, and different display colour schemes and the apparatus is configured to consider at least one of these criteria in the provision of the corresponding open instance on the second apparatus.

29. A method comprising:
   receiving a user input; and
   based on the user input, providing an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus.
30. The method of claim 29, wherein the first and at least related camera control applications are configured to control a camera comprised by the first apparatus.

31. The method of claim 29 or claim 30 further comprising selecting the second apparatus from a plurality of apparatuses based on the user input.

32. The method of claim 31, wherein the second apparatus is selected based upon a direction of the user input, wherein the direction corresponds to the relative locations of the first and second apparatuses.

33. The method of claim 31, wherein the second apparatus is selected based upon the user input being received at the second device.

34. The method of any of claims 29 to 33, wherein the user input is received by the first apparatus.

35. The method of any of claims 29 to 33, wherein the user input is received by the second apparatus.

36. The method of any of claims 29 to 35, further comprising:
   causing the open instance of a first application to be progressively removed from display from the first apparatus; and
   causing the corresponding open instance of the at least related application to be progressively displayed on the second apparatus based on the user input.

37. The method of any of claims 29 to 36, further comprising progressively displaying the proportion of the corresponding open instance of the at least related camera control application on the second apparatus based on at least a characteristic of the received user input.
38. The method of claim 37, wherein the corresponding open instance of the at least related camera control application is progressively displayed on the second apparatus in a direction corresponding to a direction of the received user input.

39. The method of claim 37 or claim 38, wherein the the proportion of the open instance of the first camera control application is progressively removed from display on the first apparatus and the proportion of the corresponding open instance of the at least related camera control application is correspondingly progressively displayed on the second apparatus based on the at least a characteristic of the user input.

40. The method of any of claims 37 to 39, wherein the characteristic of the user input comprises at least one of: the direction of the user input, the speed of the user input, the extent of the user input, and the reversal of the user input.

41. The method of any of claims 29 to 40, further comprising continuing to display the open instance of the first camera control application on the first apparatus after the corresponding open instance of the at least related camera control application is displayed on the second apparatus.

42. The method of any of claims 29 to 41, wherein the user input comprises a swipe across a touch-sensitive region of the first apparatus or the second apparatus, the swipe beginning at one edge of the touch sensitive region of the apparatus.

43. The method of any of claims 29 to 41, wherein the user input comprises a swirl gesture.

44. The method any of claims 29 to 41, wherein the user input comprises a voice input.

45. The method any of claims 29 to 41, wherein the user input comprises a combination of one or more of the following gestures made on a touch sensitive display associated with the first or second apparatus: a slide, a slide from one edge of a display, a tap, a multiple tap, a press, a flick, a pinch gesture, and a swirl gesture.
46. The method of any of claims 29 to 45, further comprising providing a corresponding open instance by providing one or more of the same data content as on the first camera control application on the first apparatus in the at least related camera control application on the second apparatus.

47. The method of claim any of claims 29 to 46, further comprising providing a corresponding open instance by providing one or more of the same transient content as on the first camera control application on the first apparatus in the at least related camera control application on the second apparatus.

48. The method of claim 47, wherein the transient content comprises at least one of: a viewfinder view, a digital zoom level, and camera settings.

49. The method of any of claims 29 to 48, wherein the first camera control application and the at least related camera control application provide a common level of functionality which is provided in the respective open instances of the first and the at least related application.

50. The method of claim 49, wherein the common level of functionality comprises at least one of presenting to a user a viewfinder view of a camera, causing the camera to capture a static image, causing the camera to capture a video image, and changing a setting of the camera.

51. The method of any of claims 29 to 50, wherein the first application and the at least related application are equivalent applications provided using different operating systems of the respective first and second apparatuses.

52. The method of any of claims 29 to 51, wherein the first application and the at least related application are provided for use on the respective first and second apparatuses by communication with at least one remote server.
53. The method of any of claims 29 to 52, wherein a display of the first apparatus and a display of the second apparatus each have one or more of: different display sizes, different display form factors, different display resolutions, and different display colour schemes and the method further comprises considering at least one of these criteria in the provision of the corresponding open instance on the second apparatus.

54. A computer program configured to provide computer program code for at least the following:
   receiving a user input; and
   based on the user input, providing an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus.

55. An apparatus, the apparatus comprising:
   means for receiving a user input; and
   means for providing, based on the user input, an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus.
Figure 9

902

Receiving a user input

904

Based on the user input, provide an open instance of a first camera control application on a first apparatus as a corresponding open instance of an at least related camera control application on a second apparatus

Figure 10

1000
INTERNATIONAL SEARCH REPORT

International application No. PCT/US2012/071628

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H04N 5/222 (2013.01)
USPC - 348/333.1

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)
IPC(8) - H04N 5/222, 5/225, 7/00, 13/00 (2013.01)
USPC - 348/36, 220.1, 333.1, 382/218

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC: G06F 1/1626, H04N 9/3176, 5/23293

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
ACM, MicroPatent, Orbit.com, Google Patents

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
</table>

* 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" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  "O" document referring to an oral exposition, 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: 09 February 2013
Date of mailing of the international search report: 24 FEB 2013

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PCT OSP: 571-272-7774

Form PCT/ISA/2.10 (second sheet) (July 2009)
**INTERNATIONAL SEARCH REPORT**

**Observations where certain claims were found unsearchable** (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.Claims Nos.:
   because they relate to subject matter not required to be searched by this Authority, namely:

2.Claims Nos.:
   because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3.Claims Nos.: 5-28, 34-53
   because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Observations where unity of invention is lacking** (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 

**Remark on Protest**

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

Form PCT/ISA/2 10 (continuation of first sheet (2)) (July 2009)