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(54) Title: RENDERING SYSTEM-DEFINED LIGHT SETTINGS SIMILAR TO USER-DEFINED LIGHT SETTINGS

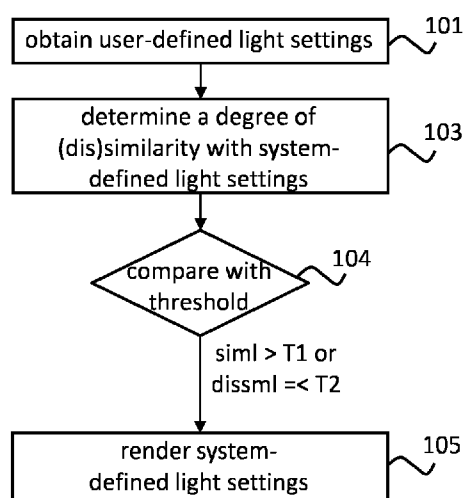


Fig. 2

(57) Abstract: A method of controlling one or more lighting devices to render system-defined light settings comprises obtaining (101) the system-defined light settings, which are defined in a system-stored light scene, and user-defined light settings, determining (103) a degree of similarity between the user-defined light settings and the system-defined light settings or a degree of dissimilarity between the user-defined light settings and the system-defined light settings, and controlling (105) the one or more lighting devices to render the system-defined light settings if the degree of similarity is determined to exceed a first threshold or the degree of dissimilarity is determined not to exceed a second threshold.

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Rendering system-defined light settings similar to user-defined light settings

FIELD OF THE INVENTION

The invention relates to a system for controlling one or more lighting devices to render system-defined light settings.

The invention further relates to a method of controlling one or more lighting
5 devices to render system-defined light settings.

The invention also relates to a computer program product enabling a computer system to perform such a method.

BACKGROUND OF THE INVENTION

10 In connected lighting systems, users are normally able to create their own local light scenes. It is also known to automatically generate local light scenes. For example, US 2021/0274621 A1 describes generating a local light scene for a newly added lighting device based on the rendering capabilities of the new lighting device. If the new lighting device is
15 configured to provide an automatically generated light setting that corresponds to a light setting of a predefined local light scene, the processor may associate the new lighting device with that local light scene instead.

US 20100251157 A1 discloses the integration of an energy function into a light management system, particularly for saving energy and monitoring energy consumption. According to an embodiment of the invention, a light management system with
20 an integrated energy function is provided, wherein the system is adapted to receiving energy information about light fixtures of a lighting system, and to processing the received energy information with regard to energy consumption of the lighting system. The energy function may be for example used to automatically configure a lighting system to low energy consumption, to allow further configurations of the lighting system with regard to lowering
25 energy consumption, or to provide a user with a sensible set of lights that can be turned off and will amount to significant energy savings when turned off.

In modern connected lighting systems, users are often able to select light scenes from a collection of light scenes, e.g. stored in the cloud. These light scenes, e.g. “Arctic aurora” and “Savanna sunset”, typically specify one or more colors. In the Philips

Hue system, if a user has a bridge, the user may download light scenes to the bridge and associate these local light scenes with lighting devices and light output levels (i.e. dim levels).

5 However, collections of light scenes are typically large, which makes it challenging for users to find light scenes with their favorite light settings. This may result in users creating their own light scenes instead, which may not be as good as some of the light scenes in the collection of light scenes.

SUMMARY OF THE INVENTION

10 It is a first object of the invention to provide a system, which allows users to more easily obtain light scenes with their favorite light settings and cause one or more lighting devices to render these light scenes.

It is a second object of the invention to provide a method, which can be used to allow users to more easily obtain light scenes with their favorite light settings and cause
15 one or more lighting devices to render these light scenes.

In a first aspect of the invention, a system for controlling one or more lighting devices to render system-defined light settings comprises at least one control interface and at least one processor configured to obtain user-defined light settings and said system-defined light settings, said system-defined light settings being defined in a system-stored light scene,
20 determine a degree of similarity between said user-defined light settings and said system-defined light settings or a degree of dissimilarity between said user-defined light settings and said system-defined light settings, and control, via said at least one control interface, said one or more lighting devices to render said system-defined light settings if said degree of similarity is determined to exceed a first threshold or said degree of dissimilarity is
25 determined not to exceed a second threshold.

By controlling the one or more lighting devices to render similar system-defined light settings instead user-defined light settings, the user of the system may obtain a system-stored light scene with the user's favorite light settings that might even better than the light scene that the user has defined or than what the user has set to the lighting device(s)
30 now. In this way, the user experience may be increased, as with the number of possible light settings and light scenes, the user interface might become confusing or it might become difficult to oversee the possibilities, and the user might not be aware that there are light scenes available with the user's favorite light settings, e.g. color settings, implemented.

Said user-defined light settings may comprise current light settings being
35 rendered by said one or more lighting devices. As a first example, said at least one processor may be configured to, if said degree of similarity is determined to exceed said first threshold

or said degree of dissimilarity is determined not to exceed said second threshold, generate a first output signal requesting said user of said system whether said system-defined light settings should be activated, obtain a first input signal in response to said first output signal, if said first input signal indicates that said user requests said activation, control said one or more lighting devices to render said system-defined light settings, and if said first input signal indicates that said user does not request said activation, refrain from controlling said one or more lighting devices to render said system-defined light settings. For example, if no light scene is active but the light color settings that the user selected are very close to the light color settings of a system-stored light scene, the user's light control app may suggest to the user to select that system-stored light scene instead.

As a second example, said at least one processor may be configured to, if said degree of similarity is determined to exceed said first threshold or said degree of dissimilarity is determined not to exceed said second threshold, generate a second output signal requesting said user of said system whether said system-defined light settings should be stored, obtain a second input signal in response to said second output signal, store said system-stored light scene or a reference to said system-stored light scene in a configuration associated with a lighting system of said user if said second input signal indicates that said user requests said storing, represent said system-stored light scene in a user interface provided to said user of said system, and control said one or more lighting devices to render said system-defined light settings if said user selects said system-stored light scene in said user interface.

In this second example, said at least one processor is further configured to, if said second input signal indicates that said user does not request said storing, refrain from storing said system-stored light scene or a reference to said system-stored light scene in said configuration associated with said lighting system of said user. For example, when a user edits the light settings, similarity to a collection of system-stored light scenes may be used as trigger to suggest downloading/storing a matching system-stored light scene from the collection. By allowing the user to activate or store the system-stored light scene, the usage of system-stored light scenes, or even light scenes in general, may be increased.

Said user-defined light settings may be stored in a user-defined light scene and said at least one processor may be configured to replace said user-defined light scene with said system-stored light scene or a reference to said system-stored light scene.

For example, said at least one processor may be configured to, if said degree of similarity is determined to exceed said first threshold or said degree of dissimilarity is determined not to exceed said second threshold, generate a first output signal requesting said

user of said system whether said user-defined light scene should be replaced with said system-stored light scene, obtain a first input signal in response to said first output signal, replace said user-defined light scene with said system-stored light scene or a reference to said system-stored light scene in a configuration associated with a lighting system of said user if said first input signal indicates that said user requests said replacement, and refrain from replacing said user-defined light scene with said system-stored light scene or a reference to said system-stored light scene in said configuration associated with said lighting system of said user if said first input signal indicates that said user does not request said replacement.

The system may comprise a recommender software component which generates the first output signal, for example. If the user agrees, the user interface is updated such that the matching system-stored light scene is shown, e.g. instead of the user-defined light scene. Other system-stored light scenes may be shown/recommended in the user interface as well. For example, other system-stored light scenes that are liked/used by the same persons that like the matching system-stored light scene may be shown/recommended. For instance, if a user created a light scene that is similar to a system-stored “Miami” light scene, not only the “Miami” light scene may be shown/recommended, but also an “Osaka” system-stored light scene that is liked/used by the same persons that like the “Miami” light scene.

Said at least one processor may be configured to represent said system-stored light scene instead of said user-defined light scene in a user interface provided to said user of said system, said system-stored light scene being represented with a name which was associated with said user-defined light scene, and control said one or more lighting devices to render said system-defined light settings if said user selects said system-stored light scene in said user interface. This name makes it easier for the user to find the (local) light scene that has the user’s favorite light settings.

Said at least one processor may be configured to represent said system-stored light scene in said user interface with an image associated with said system-stored light scene instead of an image which was associated with said user-defined light scene. This may be used to improve the user experience. For example, a sunset light scene may be associated with a photograph of a sunset.

Said at least one processor may be configured to determine a new name for said system-stored light scene in said user interface based on a system-defined name associated with said system-stored light scene or based on said system-defined light settings, generate a second output signal asking said user of said system whether a current name of

said system-stored light scene in said user interface should be changed to said new name, obtain a second input signal in response to said second output signal, and if said second input signal indicates that said user requests said name change, represent said system-stored light scene with said new name in said user interface. This may be beneficial, for example, if the name of the user-defined light scene is not very representative of the light settings in the user-defined light scene.

Said at least one processor may be configured to, upon determining that a new system-stored light scene has become available, obtain said user-defined light settings stored in said user-defined light scene and said system-defined light settings defined in said system-stored light scene and determine said degree of similarity or said degree of dissimilarity, said system-stored light scene being said new system-stored light scene. For example, every once in a while, the system may check whether a new system-stored light scene has been added to a collection of light scenes, e.g. stored in the cloud, and determine whether this new system-stored light scene is similar to one of the user-defined light scenes.

Said at least one processor may be configured to obtain further user-defined light settings stored in a further user-defined light scene, determine a further degree of similarity between said user-defined light settings and said further user-defined light settings or a further degree of dissimilarity between said user-defined light settings and said further user-defined light settings, and remove said further user-defined light scene if said further degree of similarity is determined to exceed said first threshold or a third threshold or said further degree of dissimilarity is determined not to exceed said second threshold or a fourth threshold. Thus, if the lighting system has two similar user-defined light scenes, one may be removed and the other may be replaced with the system-stored light scene. In this way, light scenes that are too similar may be deleted.

Said system-stored light scene may be a daylight-mimicking light scene, said system-defined light settings may comprise a plurality of sets of light settings, each of said sets of light settings may be associated with a time of day, and said at least one processor may be configured to, for each respective set of light settings of said plurality of sets of light settings, determine a degree of similarity between said user-defined light settings and said respective set of light settings or a degree of dissimilarity between said user-defined light settings and said respective set of light settings, and control, via said at least one control interface, said one or more lighting devices to render said system-defined light settings of said daylight-mimicking light scene if any of said degrees of similarity is determined to

exceed said first threshold or any of said degrees of dissimilarity is determined not to exceed said second threshold.

Daylight-mimicking light scenes are also known as circadian light scenes. A daylight-mimicking light scene typically uses different shades of warm-to-cool white light to mimic the sun's movement throughout the day and causes one or more lighting devices to automatically transition throughout the day, e.g. starting with bright, cool tones in the morning and ending with a warmer, golden glow as the sun goes down. The user may have defined a user-defined light scene which reflects daylight at a certain moment of the day, e.g. because the user does not know that a daylight-mimicking light scene exists. In this case, the user may get a better experience when the daylight-mimicking light scene is used instead.

Said one or more lighting devices may comprise a plurality of lighting devices, said user-defined light settings may comprise a plurality of user-defined sets of light settings, each of said plurality of user-defined sets may have been associated with a different lighting device of said plurality of lighting devices, said system-defined light settings may comprise a plurality of system-defined sets of light settings, and each of said plurality of system-defined sets may have been associated with a different lighting device of said plurality of lighting devices.

Said at least one processor may be configured to determine said degree of similarity by determining a degree of similarity between each user-defined set of light settings and a corresponding system-defined set of light settings or by determining a degree of similarity between each user-defined set of light settings and each system-defined set of light settings, or determine said degree of dissimilarity by determining a degree of dissimilarity between each user-defined set of light settings and a corresponding system-defined set of light settings or by determining a degree of dissimilarity between each user-defined set of light settings and each system-defined set of light settings.

This may be beneficial when one or more system-stored light scenes are associated with lighting devices, e.g. if the user has already selected one or more light scenes from a collection of light scenes and assigned light settings of the selected system-stored light scene to lighting devices of the user's lighting system. The user may be able to indicate whether the user wants an exact match, e.g. the system-stored and user-defined light scene specify similar colors for the same lighting device, or an approximate match, e.g. the system-stored light scene specifies colors for a certain lighting device and the user-defined light scene specifies similar colors for the same lighting device or for a different lighting device.

If the system-stored light scene that matches the user-defined light scene is not associated with lighting devices, the system-stored light scene may be associated with lighting devices of the user's lighting system based on the mapping of light settings to lighting devices as defined in the user-defined light scene.

5 In a second aspect of the invention, a method of controlling one or more lighting devices to render system-defined light settings comprises obtaining user-defined light settings and said system-defined light settings, said system-defined light settings being defined in a system-stored light scene, determining a degree of similarity between said user-defined light settings and said system-defined light settings or a degree of dissimilarity
10 between said user-defined light settings and said system-defined light settings, and controlling said one or more lighting devices to render said system-defined light settings if said degree of similarity is determined to exceed a first threshold or said degree of dissimilarity is determined not to exceed a second threshold. Said method may be performed by software running on a programmable device. This software may be provided as a
15 computer program product.

Moreover, a computer program for carrying out the methods described herein, as well as a non-transitory computer readable storage-medium storing the computer program are provided. A computer program may, for example, be downloaded by or uploaded to an existing device or be stored upon manufacturing of these systems.

20 A non-transitory computer-readable storage medium stores at least one software code portion, the software code portion, when executed or processed by a computer, being configured to perform executable operations for controlling one or more lighting devices to render system-defined light settings.

The executable operations comprise obtaining user-defined light settings and
25 said system-defined light settings, said system-defined light settings being defined in a system-stored light scene, determining a degree of similarity between said user-defined light settings and said system-defined light settings or a degree of dissimilarity between said user-defined light settings and said system-defined light settings, and controlling said one or more lighting devices to render said system-defined light settings if said degree of similarity is
30 determined to exceed a first threshold or said degree of dissimilarity is determined not to exceed a second threshold.

As will be appreciated by one skilled in the art, aspects of the present invention may be embodied as a device, a method or a computer program product. Accordingly, aspects of the present invention may take the form of an entirely hardware

embodiment, an entirely software embodiment (including firmware, resident software, micro-code, etc.) or an embodiment combining software and hardware aspects that may all generally be referred to herein as a "circuit", "module" or "system." Functions described in this disclosure may be implemented as an algorithm executed by a processor/microprocessor of a computer. Furthermore, aspects of the present invention may take the form of a computer program product embodied in one or more computer readable medium(s) having computer readable program code embodied, e.g., stored, thereon.

Any combination of one or more computer readable medium(s) may be utilized. The computer readable medium may be a computer readable signal medium or a computer readable storage medium. A computer readable storage medium may be, for example, but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, or device, or any suitable combination of the foregoing. More specific examples of a computer readable storage medium may include, but are not limited to, the following: an electrical connection having one or more wires, a portable computer diskette, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), an optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage device, a magnetic storage device, or any suitable combination of the foregoing. In the context of the present invention, a computer readable storage medium may be any tangible medium that can contain, or store, a program for use by or in connection with an instruction execution system, apparatus, or device.

A computer readable signal medium may include a propagated data signal with computer readable program code embodied therein, for example, in baseband or as part of a carrier wave. Such a propagated signal may take any of a variety of forms, including, but not limited to, electro-magnetic, optical, or any suitable combination thereof. A computer readable signal medium may be any computer readable medium that is not a computer readable storage medium and that can communicate, propagate, or transport a program for use by or in connection with an instruction execution system, apparatus, or device.

Program code embodied on a computer readable medium may be transmitted using any appropriate medium, including but not limited to wireless, wireline, optical fiber, cable, RF, etc., or any suitable combination of the foregoing. Computer program code for carrying out operations for aspects of the present invention may be written in any combination of one or more programming languages, including an object oriented

programming language such as Java(TM), Smalltalk, C++ or the like and conventional procedural programming languages, such as the "C" programming language or similar programming languages. The program code may execute entirely on the user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer, or entirely on the remote computer or server. In the latter scenario, the remote computer may be connected to the user's computer through any type of network, including a local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the Internet using an Internet Service Provider).

Aspects of the present invention are described below with reference to flowchart illustrations and/or block diagrams of methods, apparatus (systems), and computer program products according to embodiments of the present invention. It will be understood that each block of the flowchart illustrations and/or block diagrams, and combinations of blocks in the flowchart illustrations and/or block diagrams, can be implemented by computer program instructions. These computer program instructions may be provided to a processor, in particular a microprocessor or a central processing unit (CPU), of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer, other programmable data processing apparatus, or other devices create means for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

These computer program instructions may also be stored in a computer readable medium that can direct a computer, other programmable data processing apparatus, or other devices to function in a particular manner, such that the instructions stored in the computer readable medium produce an article of manufacture including instructions which implement the function/act specified in the flowchart and/or block diagram block or blocks.

The computer program instructions may also be loaded onto a computer, other programmable data processing apparatus, or other devices to cause a series of operational steps to be performed on the computer, other programmable apparatus or other devices to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide processes for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

The flowchart and block diagrams in the figures illustrate the architecture, functionality, and operation of possible implementations of devices, methods and computer

program products according to various embodiments of the present invention. In this regard, each block in the flowchart or block diagrams may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function(s). It should also be noted that, in some alternative implementations, the functions noted in the blocks may occur out of the order noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. It will also be noted that each block of the block diagrams and/or flowchart illustrations, and combinations of blocks in the block diagrams and/or flowchart illustrations, can be implemented by special purpose hardware-based systems that perform the specified functions or acts, or combinations of special purpose hardware and computer instructions.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects of the invention are apparent from and will be further elucidated, by way of example, with reference to the drawings, in which:

Fig. 1 is a block diagram of an embodiment of the system;

Fig. 2 is a flow diagram of a first embodiment of the method;

Fig. 3 is a flow diagram of a second embodiment of the method;

Fig. 4 is a flow diagram of a third embodiment of the method;

Fig. 5 is a flow diagram of a fourth embodiment of the method;

Fig. 6 is a flow diagram of a fifth embodiment of the method;

Fig. 7 is a flow diagram of a sixth embodiment of the method;

Fig. 8 is a flow diagram of a seventh embodiment of the method;

Fig. 9 is a flow diagram of an eighth embodiment of the method;

Fig. 10 is a flow diagram of a ninth embodiment of the method; and

Fig. 11 is a block diagram of an exemplary data processing system for performing the method of the invention.

Corresponding elements in the drawings are denoted by the same reference numeral.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Fig. 1 shows an embodiment of the system for controlling one or more lighting devices to render system-defined light settings. In this embodiment, the system is a light controller 1. The light controller 1 may be a Philips Hue bridge, for example. The light

controller 1 is connected to a wireless LAN access point 13, e.g. via Ethernet or Wi-Fi. The wireless LAN access point 13 is connected to the Internet 11.

The light controller 1 is able to communicate with lighting devices 31-34, e.g. using Zigbee technology. A user of user device 21 is able to use an app running on their user device to control one or more of lighting devices 31-34 via the light controller 1. A user device may be, for example, a mobile device such as a mobile phone, a tablet or a smart watch. In the example of Fig. 1, user device 21 is connected directly to the wireless LAN access point 13. Alternatively, user device 21 may be connected to the Internet remotely, e.g. via an LTE or 5G mobile communication network.

A user interface is provided on the user device 21. This user interface represents light scenes. The user may select one of the represented light scenes, after which the one or more lighting devices associated with the selected light scene are controlled to render the light settings of the selected light scene. This user interface may additionally allow the user to change light settings of lighting devices manually.

The light controller 1 comprises a receiver 3, a transmitter 4, a processor 5, and memory 7. In the embodiment of Fig. 1, a collection of system-stored light scenes is stored on an Internet server 29. In the Philips Hue system, this is called the Scene gallery. When the user selects one of these system-stored light scenes and associates it with a lighting device of the user's lighting system, this system-stored light scene is downloaded to the memory 7 of the light controller 1. In this embodiment, user-defined light scenes are also stored in the memory 7 of the light controller 1.

In an alternative embodiment, the selected system-stored light scene is not downloaded to the memory 7 of the light controller 1, but a reference to this system-stored light scene is stored in a configuration associated with the user's lighting system. This configuration may be stored on Internet server 29 or in memory 7 of the light controller 1. In this alternative embodiment, user-defined light scenes may be stored on Internet server 29 or in memory 7 of the light controller 1. The user's lighting system may be considered to comprise the light controller 1, the lighting devices 31-34, and if applicable, a configuration stored on Internet server 29.

The processor 5 is configured to obtain user-defined light settings and system-defined light settings. The system-defined light settings are defined in a system-stored light scene. The processor 5 is further configured to determine a degree of similarity between the user-defined light settings and the system-defined light settings or a degree of dissimilarity between the user-defined light settings and the system-defined light settings, and control, via

the transmitter 4, one or more of the lighting devices 31-34 to render the system-defined light settings, e.g. instead of the user-defined light settings, if the degree of similarity is determined to exceed a first threshold or the degree of dissimilarity is determined not to exceed a second threshold.

5 For example, an algorithm running on the processor 5 may obtain the current light settings (e.g. color, brightness, dynamics), e.g. from the memory 7, and compare them to the system-defined light settings of the system-stored light scenes downloaded to the memory 7 and/or available on the Internet server 29. If the light controller 1 has scene state awareness functionality, it is able to detect which light scene is active. Furthermore, the light
10 controller 1 typically knows which light settings are active on the lighting devices.

Whenever a user sets the lights to custom light settings with the app running on user device 21, which may then be stored in the memory 7 of the light controller 1, the algorithm compares the custom (current) light settings with the system-defined light settings and when there is a system-stored light scene available with (almost) the same light settings,
15 the algorithm causes the light controller 1 to notify the app running on the user device 21.

In this example, the user then gets a pop-up from the app and can then decide to either try the system-stored light scene or ignore the pop-up (cancel). When the user tries the system-stored light scene but does not like it, the custom (user-defined) settings that the user selected before the suggestion are used again. If the user likes the scene, the user can add
20 the system-stored scene to a room and keep the system-defined light settings or revert to the user-defined light settings the user had chosen before the suggestion.

Other embodiments/examples will be described in relation to Figs. 2 to 10. For example, user-defined light scenes stored in memory 7 may additionally or alternatively be compared with system-stored light scenes downloaded to the memory 7 and/or available on
25 the Internet server 29. The processor 5 may be configured to perform one or more of the methods of Figs. 2 to 10. For example, the processor 5 may be configured to perform the method of Fig. 2 and the method of Fig. 6.

In the embodiment of the light controller 1 shown in Fig. 1, the light controller 1 comprises one processor 5. In an alternative embodiment, the light controller 1 comprises
30 multiple processors. The processor 5 of the light controller 1 may be a general-purpose processor, e.g. ARM-based, or an application-specific processor. The processor 5 of the light controller 1 may run a Unix-based operating system for example. The memory 7 may comprise one or more memory units. The memory 7 may comprise one or more hard disks and/or solid-state memory, for example.

The receiver 3 and the transmitter 4 may use one or more wired or wireless communication technologies such as Zigbee to communicate with the lighting devices 31-34 and Ethernet to communicate with the wireless LAN access point 13, for example. In an alternative embodiment, multiple receivers and/or multiple transmitters are used instead of a single receiver and a single transmitter. In the embodiment shown in Fig. 1, a separate receiver and a separate transmitter are used. In an alternative embodiment, the receiver 3 and the transmitter 4 are combined into a transceiver. The light controller 1 may comprise other components typical for a light controller such as a power connector. The invention may be implemented using a computer program running on one or more processors.

In the embodiment of Fig. 1, the system of the invention is a light controller. In an alternative embodiment, the system of the invention is a different device, e.g. a cloud computer (cluster) or a mobile device. If the system is a mobile device, light scenes may be downloaded from the Internet server 29 and stored on the mobile device or on the light controller or all light scenes may be stored only on the Internet server 29, for example.

If the system is a mobile device, whenever a user sets the lighting devices to custom light settings with an app running on the mobile device, the mobile device may perform an algorithm to compare the custom/user-defined (current) light settings with the system-defined light settings (stored on the mobile device or on Internet server 29), and when there is a system-stored light scene available with (almost) the same light settings, the algorithm may notify the user e.g. via a pop-up.

In the embodiment of Fig. 1, the system of the invention comprises a single device. In an alternative embodiment, the system of the invention comprises a plurality of devices, e.g. the light controller 1 and the Internet server 29.

A first embodiment of the method of controlling one or more lighting devices to render system-defined light settings is shown in Fig. 2. The method may be performed by the light controller 1 of Fig. 1 or by a mobile device or an Internet server, for example.

A step 101 comprises obtaining user-defined light settings and the system-defined light settings. The system-defined light settings are defined in a system-stored light scene. In an alternative embodiment, the user-defined light settings and the system-defined light settings are obtained in separate steps.

A step 103 comprises determining a degree of similarity (siml) between the user-defined light settings obtained in step 101 and the system-defined light settings obtained in step 101 or a degree of dissimilarity (dissml) between the user-defined light settings and the system-defined light settings.

A step 104 comprises comparing the degree of similarity determined in step 103 with a first threshold (T1) or comparing the degree of dissimilarity determined in step 103 with a second threshold (T2). The degree of (dis)similarity and the threshold may be a percentage, for example. The first threshold may be 90% similarity or the second threshold may be 10% dissimilarity, for example. A step 105 is performed if the degree of similarity is determined to exceed the first threshold in step 104 or the degree of dissimilarity is determined not to exceed the second threshold in step 104.

Step 105 comprises controlling the one or more lighting devices to render the system-defined light settings, e.g. instead of the user-defined light settings. Additionally, one or more steps of one or more of the embodiments of Figs. 3-10 may be added to the embodiment of Fig. 2. There may be multiple additional steps between steps 104 and 105.

A second embodiment of the method of controlling one or more lighting devices to render system-defined light settings is shown in Fig. 3. The method may be performed by the light controller 1 of Fig. 1 or by a mobile device or an Internet server, for example. Step 101 comprises obtaining user-defined light settings and the system-defined light settings. The system-defined light settings are defined in a system-stored light scene. In the embodiment of Fig. 3, the user-defined light settings comprise current light settings being rendered by the one or more lighting devices.

Step 103 comprises determining a degree of similarity (siml) between the user-defined light settings obtained in step 101 and the system-defined light settings obtained in step 101 or a degree of dissimilarity (dissml) between the user-defined light settings and the system-defined light settings.

Step 104 comprises comparing the degree of similarity determined in step 103 with a first threshold (T1) or comparing the degree of dissimilarity determined in step 103 with a second threshold (T2). A step 121 is performed if the degree of similarity is determined to exceed the first threshold in step 104 or the degree of dissimilarity is determined not to exceed the second threshold in step 104.

Step 121 comprises generating one or more output signals requesting the user of the system whether the system-defined light settings should be activated and requesting the user of the system whether the system-defined light settings should be stored. In an alternative embodiment, the user is only requested whether the system-defined light settings should be activated or requested whether the system-defined light settings should be stored and not both. A step 123 comprises obtaining an input signal in response to the one or more output signals generated in step 121.

A step 125 comprises checking if the input signal obtained in step 123 indicates that the user requests the activation or indicates that the user requests the storing. Step 105 is performed if the input signal indicates that the user requests the activation. Step 105 comprises controlling the one or more lighting devices to render the system-defined light settings instead of the user-defined light settings. A step 127 is performed if the input signal indicates that the user requests the storing. Step 127 comprises storing the system-stored light scene or a reference to the system-stored light scene in a configuration associated with a lighting system of the user.

If the system-stored light scene is not associated with lighting devices, the system-stored light scene may be associated with lighting devices of the user's lighting system based on the mapping of light settings to lighting devices as defined in the user-defined light scene.

If the input signal indicates that the user does not request the activation, the method refrains from controlling the one or more lighting devices to render the system-defined light settings in response to the input signal. If the input signal indicates that the user does not request the storing, the method refrains from storing the system-stored light scene or a reference to the system-stored light scene in the configuration associated with the lighting system of the user in response to the input signal. Step 121 may be repeated after step 105 or step 127 has been performed. For example, a user may first request that the system-defined light settings should be activated and then that the system-defined light settings should be stored or vice versa.

Later, a step 129 is performed. Step 129 comprises representing the system-stored light scene in a user interface provided to the user of the system. A step 131 comprises checking whether the user has selected the system-stored light scene in the user interface. If so, step 105 is performed. Step 105 comprises controlling the one or more lighting devices to render the system-defined light settings.

If it is determined in step 131 that the user has selected another light scene, the one or more lighting devices may be controlled to render the light settings of this other light scene. This is not shown in Fig. 3. Step 129 may be repeated after the user has selected another light scene. Step 129 may also be repeated after the user has selected the system-stored light scene. Additionally, one or more steps of one or more of the embodiments of Figs. 8-10 may be added to the embodiment of Fig. 3.

A third embodiment of the method of controlling one or more lighting devices to render system-defined light settings is shown in Fig. 4. The method may be performed by

the light controller 1 of Fig. 1 or by a mobile device or an Internet server, for example. Step 101 comprises obtaining user-defined light settings and the system-defined light settings. The system-defined light settings are defined in a system-stored light scene. In the embodiment of Fig. 4, the user-defined light settings are stored in a user-defined light scene.

5 Step 103 comprises determining a degree of similarity (siml) between the user-defined light settings obtained in step 101 and the system-defined light settings obtained in step 101 or a degree of dissimilarity (dissml) between the user-defined light settings and the system-defined light settings. Step 104 comprises comparing the degree of similarity determined in step 103 with a first threshold (T1) or comparing the degree of dissimilarity
10 determined in step 103 with a second threshold (T2). A step 141 is performed if the degree of similarity is determined to exceed the first threshold in step 104 or the degree of dissimilarity is determined not to exceed the second threshold in step 104.

 Step 141 comprises generating an output signal requesting the user of the system whether the user-defined light scene should be replaced with the system-stored light
15 scene. Step 143 comprises obtaining an input signal in response to the output signal generated in step 141. A step 145 comprises checking if the input signal obtained in step 143 indicates that the user requests the replacement. A step 147 is performed if the input signal indicates that the user requests the replacement.

 Step 147 comprises replacing the user-defined light scene with the system-
20 stored light scene or a reference to the system-stored light scene in a configuration associated with a lighting system of the user. If the system-stored light scene is not associated with lighting devices, the system-stored light scene may be associated with lighting devices of the user's lighting system based on the mapping of light settings to lighting devices as defined in the user-defined light scene.

25 If the input signal indicates that the user does not request the replacement, the method refrains from replacing the user-defined light scene with the system-stored light scene or a reference to the system-stored light scene in the configuration associated with the lighting system of the user in response to the input signal.

 Later, a step 149 is performed. Step 149 comprises representing the system-
30 stored light scene in a user interface provided to the user of the system. The system-stored light scene is represented instead of the user-defined light scene. In the embodiment of Fig. 4, the system-stored light scene is represented with a name which was associated with the user-defined light scene. The system-stored light scene may be represented in the user interface

with an image associated with the original system-stored light scene or with an image which was associated with the user-defined light scene.

A step 151 comprises checking whether the user has selected the system-stored light scene in the user interface. If so, step 105 is performed. Step 105 comprises
5 controlling the one or more lighting devices to render the system-defined light settings.

If it is determined in step 151 that the user has selected another light scene, the one or more lighting devices may be controlled to render the light settings of this other light scene. This is not shown in Fig. 4. Step 149 may be repeated after the user has selected another light scene. Step 149 may also be repeated after the user has selected the system-
10 stored light scene. Additionally, one or more steps of one or more of the embodiments of Figs. 5-10 may be added to the embodiment of Fig. 4.

In the embodiment of Fig. 4, the user-defined light scene is replaced with the system-stored light scene. In an alternative embodiment, the system-stored light scene is stored in addition to the user-defined light scene or the user can choose whether the user-
15 defined light scene should be replaced or the system-stored light scene should be stored as additional light scene.

A fourth embodiment of the method of controlling one or more lighting devices to render system-defined light settings is shown in Fig. 5. The embodiment of Fig. 5 is an extension of the embodiment of Fig. 4. A step 171 is performed after step 147 of Fig. 4
20 has been performed. Step 147 comprises replacing the user-defined light scene with the system-stored light scene or a reference to the system-stored light scene in a configuration associated with a lighting system of the user.

Step 171 comprises determining a new name for the system-stored light scene in the user interface based on a system-defined name associated with the system-stored light scene or based on the system-defined light settings. A step 173 comprises generating a
25 second output signal asking the user of the system whether a current name of the system-stored light scene in the user interface should be changed to the new name.

A step 175 comprises obtaining a second input signal in response to the second output signal. A step 177 comprises checking whether the second input signal indicates that
30 the user requests the name change. If not, steps 149, 151, and 105 of Fig. 4 are performed and the system-stored light scene will be represented with a name which was associated with the user-defined light scene. If the second input signal indicates that the user requests the name change, steps 179, 191, and 105 are performed instead.

Step 179 comprises representing the system-stored light scene with the new name determined in step 171 in the user interface. A step 181 comprises checking whether the user has selected the system-stored light scene in the user interface. If so, step 105 is performed. Step 105 comprises controlling the one or more lighting devices to render the system-defined light settings.

If it is determined in step 181 that the user has selected another light scene, the one or more lighting devices may be controlled to render the light settings of this other light scene. This is not shown in Fig. 5. Step 179 may be repeated after the user has selected another light scene. Step 179 may also be repeated after the user has selected the system-stored light scene. Additionally, one or more steps of one or more of the embodiments of Figs. 6-10 may be added to the embodiment of Fig. 5.

A fifth embodiment of the method of controlling one or more lighting devices to render system-defined light settings is shown in Fig. 6. The method may be performed by the light controller 1 of Fig. 1 or by a mobile device or an Internet server, for example.

A step 201 comprises obtaining information on a collection of system-stored light scenes, e.g. stored on Internet server 29 of Fig. 1. A step 203 comprises checking, based on the information obtained in step 201, whether a new system-stored light scene has become available. If so, step 101 is performed.

Step 101 comprises obtaining user-defined light settings and the system-defined light settings. The system-defined light settings are defined in a system-stored light scene. The system-stored light scene is the new system-stored light scene identified in step 203.

Step 103 comprises determining a degree of similarity (siml) between the user-defined light settings obtained in step 101 and the system-defined light settings obtained in step 101 or a degree of dissimilarity (dissml) between the user-defined light settings and the system-defined light settings. Step 104 comprises comparing the degree of similarity determined in step 103 with a first threshold (T1) or comparing the degree of dissimilarity determined in step 103 with a second threshold (T2).

A step 147 is performed if the degree of similarity is determined to exceed the first threshold in step 104 or the degree of dissimilarity is determined not to exceed the second threshold in step 104. Step 147 comprises replacing the user-defined light scene with the system-stored light scene or a reference to the system-stored light scene in a configuration associated with a lighting system of the user. Step 203 may be repeated after step 147 to check whether more than one new system-stored light scene has become available.

Later, a step 149 is performed. Step 149 comprises representing light scenes in a user interface provided to the user of the system. A new system-stored light scene is represented instead of the user-defined light scene that it has been replaced with in step 147. A step 151 comprises checking whether the user has selected the new system-stored light scene in the user interface. If so, step 105 is performed. Step 105 comprises controlling the one or more lighting devices to render the system-defined light settings. Additionally, one or more steps of one or more of the embodiments of Figs. 4-5 and 7-10 may be added to the embodiment of Fig. 6.

A sixth embodiment of the method of controlling one or more lighting devices to render system-defined light settings is shown in Fig. 7. The embodiment of Fig. 7 is an extension of the embodiment of Fig. 6. A step 211 is performed after step 147 of Fig. 6 has been performed. Step 147 comprises replacing the user-defined light scene with the system-stored light scene or a reference to the system-stored light scene in a configuration associated with a lighting system of the user.

Step 211 comprises obtaining further user-defined light settings stored in a further user-defined light scene. A step 213 comprises determining a further degree of similarity (siml2) between the user-defined light settings and the further user-defined light settings or a further degree of dissimilarity (dissml2) between the user-defined light settings and the further user-defined light settings.

A step 214 comprises comparing the degree of similarity determined in step 213 with the first threshold (T1) or comparing the degree of dissimilarity determined in step 213 with the second threshold (T2). A step 215 is performed if the degree of similarity is determined to exceed the first threshold in step 214 or the degree of dissimilarity is determined not to exceed the second threshold in step 214. Step 215 comprises removing the further user-defined light scene.

Later, a step 149 is performed. Step 149 comprises representing light scenes in a user interface provided to the user of the system. A new system-stored light scene is represented instead of the user-defined light scene that it has been replaced with in step 147. A step 151 comprises checking whether the user has selected the new system-stored light scene in the user interface. If so, step 105 is performed. Step 105 comprises controlling the one or more lighting devices to render the system-defined light settings. Additionally, one or more steps of one or more of the embodiments of Figs. 4-5 and 8-10 may be added to the embodiment of Fig. 7.

A seventh embodiment of the method of controlling one or more lighting devices to render system-defined light settings is shown in Fig. 8. The method may be performed by the light controller 1 of Fig. 1 or by a mobile device or an Internet server, for example.

5 Step 101 comprises obtaining user-defined light settings and the system-defined light settings. The system-defined light settings are defined in a system-stored light scene. In the embodiment of Fig. 8, the system-stored light scene is a daylight-mimicking light scene and the system-defined light settings comprise a plurality of sets of light settings of which each set is associated with a time of day. For example, the light output level may be
10 highest around noon and the color may include more red around sunrise and sunset.

Daylight-mimicking light scenes are also known as circadian light scenes. A daylight-mimicking light scene typically uses different shades of warm-to-cool white light to mimic the sun's movement throughout the day and causes one or more lighting devices to automatically transition throughout the day, e.g. starting with bright, cool tones in the
15 morning and ending with a warmer, golden glow as the sun goes down.

A step 231 comprises determining, for each respective set of light settings of the plurality of sets of light settings, a degree of similarity ($\text{siml}[i]$ for set i) between the user-defined light settings and the respective set of light settings or a degree of dissimilarity ($\text{dissml}[i]$ for set i) between the user-defined light settings and the respective set of light
20 settings. For example, the daylight-mimicking light scene may have a set of light settings for each minute or each hour of the day or such sets may be determined from the daylight-mimicking light scene.

A step 231 comprises comparing the degrees of similarity (e.g. $\text{siml}[1] \dots \text{siml}[k]$ for k sets) determined in step 231 with a first threshold ($T1$) or comparing
25 the degrees of dissimilarity (e.g. $\text{dissiml}[1] \dots \text{dissiml}[k]$ for k sets) determined in step 231 with a second threshold ($T2$). A step 235 is performed if any of the degrees of similarity is determined to exceed the first threshold in step 233 or any of the degrees of dissimilarity is determined not to exceed the second threshold in step 233.

Step 235 comprises controlling the one or more lighting devices to render the
30 system-defined light settings of the daylight-mimicking light scene, e.g. instead of the user-defined light settings. Additionally, one or more steps of one or more of the embodiments of Figs. 4-7 and 9-10 may be added to the embodiment of Fig. 8. For example, if the user-defined light settings are stored in a user-defined light scene, the user defined-light scene may be replaced with (a reference to) the daylight-mimicking light scene.

The embodiment of Fig. 8 is beneficial if the user has defined a user-defined light scene which reflects daylight at a certain moment of the day, e.g. because the user does not know that a daylight-mimicking light scene exists. In this case, the user may get a better experience when the daylight-mimicking light scene is used instead.

5 An eighth embodiment of the method of controlling one or more lighting devices to render system-defined light settings is shown in Fig. 9. The method may be performed by the light controller 1 of Fig. 1 or by a mobile device or an Internet server, for example. Step 101 comprises obtaining user-defined light settings and the system-defined light settings. The system-defined light settings are defined in a system-stored light scene.

10 In the embodiment of Fig. 9, the one or more lighting devices comprise a plurality of lighting devices and the user-defined light settings comprise a plurality of user-defined sets of light settings of which each has been associated with a different lighting device of the plurality of lighting devices. Furthermore, the system-defined light settings comprise a plurality of system-defined sets of light settings of which each has been
15 associated with a different lighting device of the plurality of lighting devices.

A step 251 comprises selecting a lighting device of the plurality of lighting devices. In the first iteration of step 251, step 251 comprises selecting a first lighting device of the plurality of lighting devices.

20 A step 253 comprises determining a degree of similarity ($\text{siml}[i,i]$) between a user-defined set of light settings associated with the lighting device selected in step 251 and a corresponding system-defined set of light settings, i.e. the system-defined set of light settings associated with the light device selected in step 251, or a degree of dissimilarity ($\text{dissiml}[i,i]$) between this user-defined set of light settings and the corresponding system-defined set of light settings. For example, $\text{siml}[1,1]$ may be determined for the first lighting device and in
25 total four degrees of (dis)similarity may be determined for four lighting devices in four iterations of step 253.

A step 255 comprises comparing the degree of similarity determined in the most recent iteration of step 253 with a first threshold (T1) or comparing the degree of dissimilarity determined in the most recent iteration of step 253 with a second threshold (T2).

30 A step 257 is performed if the degree of similarity is determined to exceed the first threshold in step 255 or the degree of dissimilarity is determined not to exceed the second threshold in step 255.

Step 257 comprises checking whether all lighting devices of the plurality of lighting devices have been selected in step 251 and therefore steps 253 and 255 have been

performed for all lighting devices of the plurality of lighting devices. If not, then step 251 is repeated and the next lighting device of the plurality of lighting devices is selected in the next iteration of step 251. The method then proceeds as shown in Fig. 9.

If all lighting devices of the plurality of lighting devices have been selected in step 251, then step 105 is performed. Step 105 comprises controlling the one or more lighting devices to render the system-defined light settings. If any degree of similarity is determined not to exceed the first threshold in step 255 or any degree of dissimilarity is determined to exceed the second threshold in step 255, then step 257 is not performed for all of the lighting devices and step 105 is not performed. Additionally, one or more steps of one or more of the embodiments of Figs. 4-8 may be added to the embodiment of Fig. 9.

In the embodiment of Fig. 9, step 105 is only performed if there is an exact match. For example, if a system-stored light scene defines the color blue for lamp 1 and the color red for lamp 2 and the user-defined light scene also defines the color blue for lamp 1 and the color red for lamp 2, then there is a match. If the user-defined light scene defines the color red for lamp 1 and the color blue for lamp 2, then there is no match.

A ninth embodiment of the method of controlling one or more lighting devices to render system-defined light settings is shown in Fig. 10. The method may be performed by the light controller 1 of Fig. 1 or by a mobile device or an Internet server, for example. Step 101 comprises obtaining user-defined light settings and the system-defined light settings. The system-defined light settings are defined in a system-stored light scene.

In the embodiment of Fig. 10, like in the embodiment of Fig. 9, the one or more lighting devices comprise a plurality of lighting devices and the user-defined light settings comprise a plurality of user-defined sets of light settings of which each has been associated with a different lighting device of the plurality of lighting devices. Furthermore, the system-defined light settings comprise a plurality of system-defined sets of light settings of which each has been associated with a different lighting device of the plurality of lighting devices.

A step 251 comprises selecting a lighting device of the plurality of lighting devices. In the first iteration of step 251, step 251 comprises selecting a first lighting device of the plurality of lighting devices.

A step 263 comprises determining degrees of similarity ($\text{siml}[i,k]$) between a user-defined set of light settings associated with the lighting device selected in step 251 and each system-defined set of light settings, or a degree of dissimilarity ($\text{dissiml}[i,k]$) between this user-defined set of light settings and each system-defined set of light settings. For

example, $\text{siml}[1,1] \dots \text{siml}[1,j]$ may be determined for the first lighting device and in total sixteen degrees of (dis)similarity may be determined for four lighting devices in four iterations of step 253.

A step 265 comprises comparing the degrees of similarity determined in the most recent iteration of step 263 with a first threshold (T1) or comparing the degrees of dissimilarity determined in the most recent iteration of step 263 with a second threshold (T2). Step 257 is performed if any of these degrees of similarity is determined to exceed the first threshold in step 265 or any of these degrees of dissimilarity is determined not to exceed the second threshold in step 265.

Step 257 comprises checking whether all lighting devices of the plurality of lighting devices have been selected in step 251 and therefore steps 263 and 265 have been performed for all lighting devices of the plurality of lighting devices. If not, then step 251 is repeated and the next lighting device of the plurality of lighting devices is selected in the next iteration of step 251. The method then proceeds as shown in Fig. 10.

If all lighting devices of the plurality of lighting devices have been selected in step 251, then step 105 is performed. Step 105 comprises controlling the one or more lighting devices to render the system-defined light settings. If there is a lighting device for which no degree of similarity is determined to exceed the first threshold in step 265 or for which all degrees of dissimilarity are determined to exceed the second threshold in step 265, then step 257 is not performed for all of the lighting devices and step 105 is not performed.

Additionally, one or more steps of one or more of the embodiments of Figs. 4-8 may be added to the embodiment of Fig. 10.

In the embodiment of Fig. 10, step 105 is already performed if there is an approximate match. For example, if a system-stored light scene defines the color blue for lamp 1 and the color red for lamp 2 and the user-defined light scene defines the color red for lamp 1 and the color blue for lamp 2, then there is a match.

The embodiments of Figs. 9 and 10 may be beneficial when one or more system-stored light scenes are associated with lighting devices, e.g. if the user has already selected one or more light scenes from a collection of light scenes and assigned light settings of the selected system-stored light scene to lighting devices of the user's lighting system. The user may be able to indicate whether the user wants an exact match, e.g. the system-stored and user-defined light scene specify similar colors for the same lighting device, or an approximate match, e.g. the system-stored light scene specifies colors for a certain lighting

device and the user-defined light scene specifies similar colors for the same lighting device or for a different lighting device.

Fig. 11 depicts a block diagram illustrating an exemplary data processing system that may perform the method as described with reference to Figs. 2-10.

As shown in Fig. 11, the data processing system 300 may include at least one processor 302 coupled to memory elements 304 through a system bus 306. As such, the data processing system may store program code within memory elements 304. Further, the processor 302 may execute the program code accessed from the memory elements 304 via a system bus 306. In one aspect, the data processing system may be implemented as a computer that is suitable for storing and/or executing program code. It should be appreciated, however, that the data processing system 300 may be implemented in the form of any system including a processor and a memory that is capable of performing the functions described within this specification.

The memory elements 304 may include one or more physical memory devices such as, for example, local memory 308 and one or more bulk storage devices 310. The local memory may refer to random access memory or other non-persistent memory device(s) generally used during actual execution of the program code. A bulk storage device may be implemented as a hard drive or other persistent data storage device. The processing system 300 may also include one or more cache memories (not shown) that provide temporary storage of at least some program code in order to reduce the quantity of times program code must be retrieved from the bulk storage device 310 during execution. The processing system 300 may also be able to use memory elements of another processing system, e.g. if the processing system 300 is part of a cloud-computing platform.

Input/output (I/O) devices depicted as an input device 312 and an output device 314 optionally can be coupled to the data processing system. Examples of input devices may include, but are not limited to, a keyboard, a pointing device such as a mouse, a microphone (e.g. for voice and/or speech recognition), or the like. Examples of output devices may include, but are not limited to, a monitor or a display, speakers, or the like. Input and/or output devices may be coupled to the data processing system either directly or through intervening I/O controllers.

In an embodiment, the input and the output devices may be implemented as a combined input/output device (illustrated in Fig. 11 with a dashed line surrounding the input device 312 and the output device 314). An example of such a combined device is a touch sensitive display, also sometimes referred to as a “touch screen display” or simply “touch

screen”. In such an embodiment, input to the device may be provided by a movement of a physical object, such as e.g. a stylus or a finger of a user, on or near the touch screen display.

A network adapter 316 may also be coupled to the data processing system to enable it to become coupled to other systems, computer systems, remote network devices, and/or remote storage devices through intervening private or public networks. The network adapter may comprise a data receiver for receiving data that is transmitted by said systems, devices and/or networks to the data processing system 300, and a data transmitter for transmitting data from the data processing system 300 to said systems, devices and/or networks. Modems, cable modems, and Ethernet cards are examples of different types of network adapter that may be used with the data processing system 300.

As pictured in Fig. 11, the memory elements 304 may store an application 318. In various embodiments, the application 318 may be stored in the local memory 308, the one or more bulk storage devices 310, or separate from the local memory and the bulk storage devices. It should be appreciated that the data processing system 300 may further execute an operating system (not shown in Fig. 11) that can facilitate execution of the application 318. The application 318, being implemented in the form of executable program code, can be executed by the data processing system 300, e.g., by the processor 302. Responsive to executing the application, the data processing system 300 may be configured to perform one or more operations or method steps described herein.

Fig. 11 shows the input device 312 and the output device 314 as being separate from the network adapter 316. However, additionally or alternatively, input may be received via the network adapter 316 and output be transmitted via the network adapter 316. For example, the data processing system 300 may be a cloud server. In this case, the input may be received from and the output may be transmitted to a user device that acts as a terminal.

Various embodiments of the invention may be implemented as a program product for use with a computer system, where the program(s) of the program product define functions of the embodiments (including the methods described herein). In one embodiment, the program(s) can be contained on a variety of non-transitory computer-readable storage media, where, as used herein, the expression “non-transitory computer readable storage media” comprises all computer-readable media, with the sole exception being a transitory, propagating signal. In another embodiment, the program(s) can be contained on a variety of transitory computer-readable storage media. Illustrative computer-readable storage media include, but are not limited to: (i) non-writable storage media (e.g., read-only memory devices within a computer such as CD-ROM disks readable by a CD-ROM drive, ROM chips

or any type of solid-state non-volatile semiconductor memory) on which information is permanently stored; and (ii) writable storage media (e.g., flash memory, floppy disks within a diskette drive or hard-disk drive or any type of solid-state random-access semiconductor memory) on which alterable information is stored. The computer program may be run on the processor 302 described herein.

The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms "a," "an," and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

The corresponding structures, materials, acts, and equivalents of all means or step plus function elements in the claims below are intended to include any structure, material, or act for performing the function in combination with other claimed elements as specifically claimed. The description of embodiments of the present invention has been presented for purposes of illustration, but is not intended to be exhaustive or limited to the implementations in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope of the present invention. The embodiments were chosen and described in order to best explain the principles and some practical applications of the present invention, and to enable others of ordinary skill in the art to understand the present invention for various embodiments with various modifications as are suited to the particular use contemplated.

CLAIMS:

1. A system (1) for controlling one or more lighting devices (31-34) to render system-defined light settings, said system (1) comprising:

at least one control interface (4); and

at least one processor (5) configured to:

5 - obtain user-defined light settings and said system-defined light settings, said system-defined light settings being defined in a system-stored light scene, wherein said user-defined light settings are stored in a user-defined light scene,

- determine a degree of similarity between said user-defined light settings and said system-defined light settings or a degree of dissimilarity between said user-defined light settings and said system-defined light settings, and

10 - control, via said at least one control interface (4), said one or more lighting devices (31-34) to render said system-defined light settings if said degree of similarity is determined to exceed a first threshold or said degree of dissimilarity is determined not to exceed a second threshold, and replace said stored user-defined light scene with said system-stored light scene.

2. A system (1) as claimed in claim 1, wherein said user-defined light settings comprise current light settings being rendered by said one or more lighting devices (31-34).

20 3. A system (1) as claimed in claim 2, wherein said at least one processor (5) is configured to:

- if said degree of similarity is determined to exceed said first threshold or said degree of dissimilarity is determined not to exceed said second threshold, generate a first output signal requesting said user of said system (1) whether said system-defined light

25 settings should be activated,

- obtain a first input signal in response to said first output signal,

- if said first input signal indicates that said user requests said activation,

control said one or more lighting devices (31-34) to render said system-defined light settings, and

- if said first input signal indicates that said user does not request said activation, refrain from controlling said one or more lighting devices (31-34) to render said system-defined light settings.

5 4. A system (1) as claimed in claim 2 or 3, wherein said at least one processor (5) is configured to:

- if said degree of similarity is determined to exceed said first threshold or said degree of dissimilarity is determined not to exceed said second threshold, generate a second output signal requesting said user of said system (1) whether said system-defined light settings should be stored,

10 - obtain a second input signal in response to said second output signal,
- if said second input signal indicates that said user requests said storing, store said system-stored light scene or a reference to said system-stored light scene in a configuration associated with a lighting system of said user, represent said system-stored light scene in a user interface provided to said user of said system (1), and if said user selects said system-stored light scene in said user interface, control said one or more lighting devices (31-34) to render said system-defined light settings, and

15 - if said second input signal indicates that said user does not request said storing, refrain from storing said system-stored light scene or a reference to said system-stored light scene in said configuration associated with said lighting system of said user.
20

5. A system (1) as claimed in claim 1, wherein said at least one processor (5) is configured to:

25 - if said degree of similarity is determined to exceed said first threshold or said degree of dissimilarity is determined not to exceed said second threshold, generate a first output signal requesting said user of said system (1) whether said user-defined light scene should be replaced with said system-stored light scene,

- obtain a first input signal in response to said first output signal,
- if said first input signal indicates that said user requests said replacement,
30 replace said user-defined light scene with said system-stored light scene or a reference to said system-stored light scene in a configuration associated with a lighting system of said user, and

- if said first input signal indicates that said user does not request said replacement, refrain from replacing said user-defined light scene with said system-stored

light scene or a reference to said system-stored light scene in said configuration associated with said lighting system of said user.

6. A system (1) as claimed in claim 1 or 5, wherein said at least one processor (5)
5 is configured to:

- represent said system-stored light scene instead of said user-defined light scene in a user interface provided to said user of said system (1), said system-stored light scene being represented with a name which was associated with said user-defined light scene, and

10 - if said user selects said system-stored light scene in said user interface, control said one or more lighting devices (31-34) to render said system-defined light settings.

7. A system (1) as claimed in claim 6, wherein said at least one processor (5) is configured to represent said system-stored light scene in said user interface with an image
15 associated with said system-stored light scene instead of an image which was associated with said user-defined light scene.

8. A system (1) as claimed in claim 6 or 7, wherein said at least one processor (5) is configured to:

20 - determine a new name for said system-stored light scene in said user interface based on a system-defined name associated with said system-stored light scene or based on said system-defined light settings,

- generate a second output signal asking said user of said system (1) whether a current name of said system-stored light scene in said user interface should be changed to
25 said new name,

- obtain a second input signal in response to said second output signal, and
- if said second input signal indicates that said user requests said name change, represent said system-stored light scene with said new name in said user interface.

30 9. A system (1) as claimed in any one of claims 1, 6, 7 or 8, wherein said at least one processor (5) is configured to, upon determining that a new system-stored light scene has become available, obtain said user-defined light settings stored in said user-defined light scene and said system-defined light settings defined in said system-stored light scene and

determine said degree of similarity or said degree of dissimilarity, said system-stored light scene being said new system-stored light scene.

10. A system (1) as claimed in any one of claims 1, 6, 7 or 8, wherein said at least one processor (5) is configured to:

- obtain further user-defined light settings stored in a further user-defined light scene,

- determine a further degree of similarity between said user-defined light settings and said further user-defined light settings or a further degree of dissimilarity

between said user-defined light settings and said further user-defined light settings, and

- remove said further user-defined light scene if said further degree of similarity is determined to exceed said first threshold or a third threshold or said further degree of dissimilarity is determined not to exceed said second threshold or a fourth threshold.

11. A system (1) as claimed in any one of the preceding claims, wherein said system-stored light scene is a daylight-mimicking light scene, said system-defined light settings comprise a plurality of sets of light settings, each of said sets of light settings is associated with a time of day, and said at least one processor (5) is configured to:

- for each respective set of light settings of said plurality of sets of light settings, determine a degree of similarity between said user-defined light settings and said respective set of light settings or a degree of dissimilarity between said user-defined light settings and said respective set of light settings, and

- control, via said at least one control interface (4), said one or more lighting devices (31-34) to render said system-defined light settings of said daylight-mimicking light scene if any of said degrees of similarity is determined to exceed said first threshold or any of said degrees of dissimilarity is determined not to exceed said second threshold.

12. A system (1) as claimed in any one of the preceding claims, wherein said one or more lighting devices comprise a plurality of lighting devices (31-34), said user-defined light settings comprise a plurality of user-defined sets of light settings, each of said plurality of user-defined sets has been associated with a different lighting device of said plurality of lighting devices (31-34), said system-defined light settings comprise a plurality of system-defined sets of light settings, each of said plurality of system-defined sets has been associated

with a different lighting device of said plurality of lighting devices (31-34), and said at least one processor (5) is configured to:

- determine said degree of similarity by determining a degree of similarity between each user-defined set of light settings and a corresponding system-defined set of light settings or by determining a degree of similarity between each user-defined set of light settings and each system-defined set of light settings, or

- determine said degree of dissimilarity by determining a degree of dissimilarity between each user-defined set of light settings and a corresponding system-defined set of light settings or by determining a degree of dissimilarity between each user-defined set of light settings and each system-defined set of light settings.

13. A method of controlling one or more lighting devices to render system-defined light settings, said method comprising:

- obtaining (101) user-defined light settings and said system-defined light settings, said system-defined light settings being defined in a system-stored light scene, wherein said user-defined light settings are stored in a user-defined light scene;

- determining (103) a degree of similarity between said user-defined light settings and said system-defined light settings or a degree of dissimilarity between said user-defined light settings and said system-defined light settings;

- controlling (105) said one or more lighting devices to render said system-defined light settings if said degree of similarity is determined to exceed a first threshold or said degree of dissimilarity is determined not to exceed a second threshold; and

- replacing said stored user-defined light scene with said system-stored light scene.

14. A computer program product for a computing device, the computer program product comprising computer program code to perform the method of claim 13 when the computer program product is run on a processing unit of the computing device.

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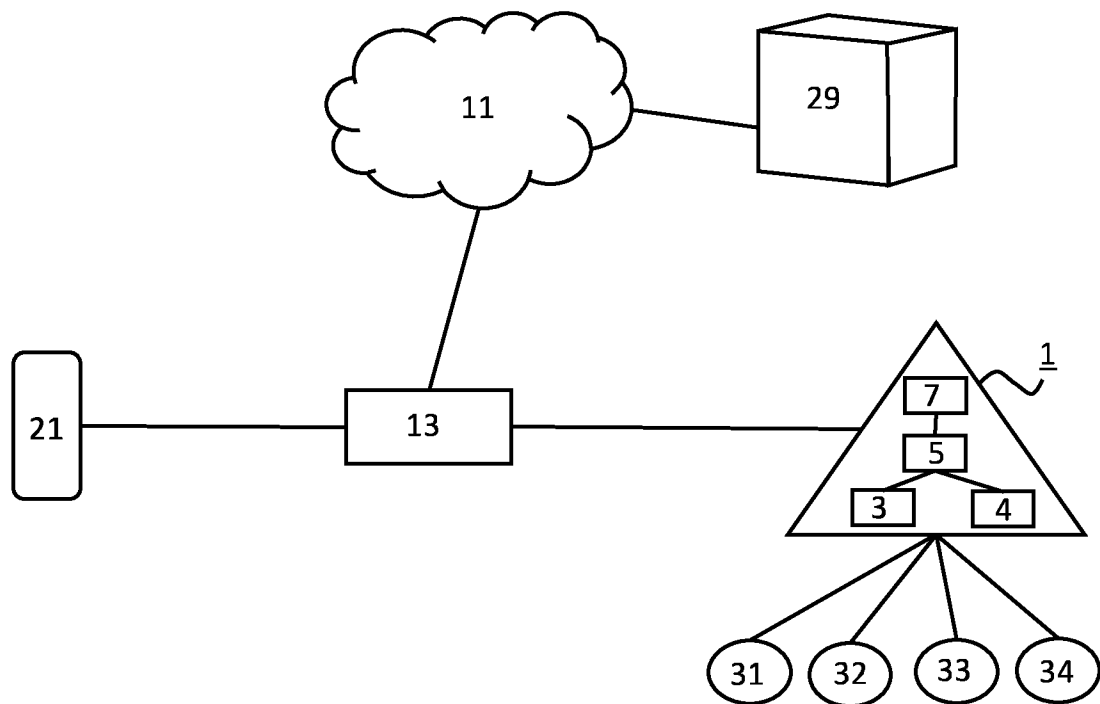


Fig. 1

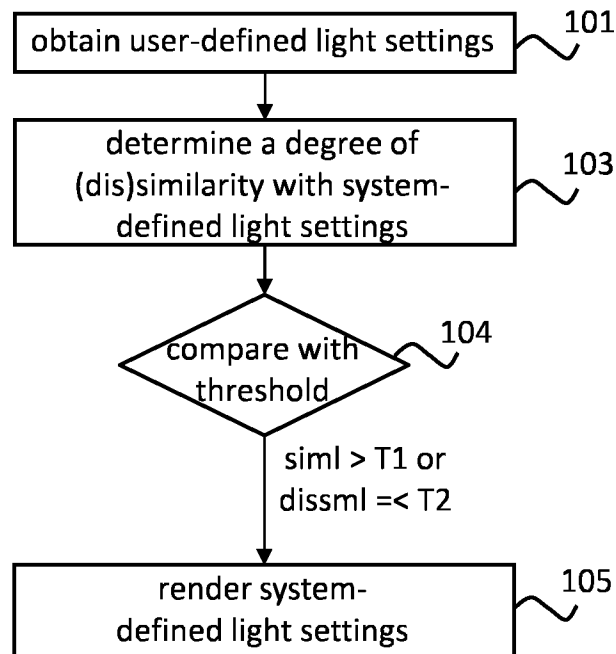


Fig. 2

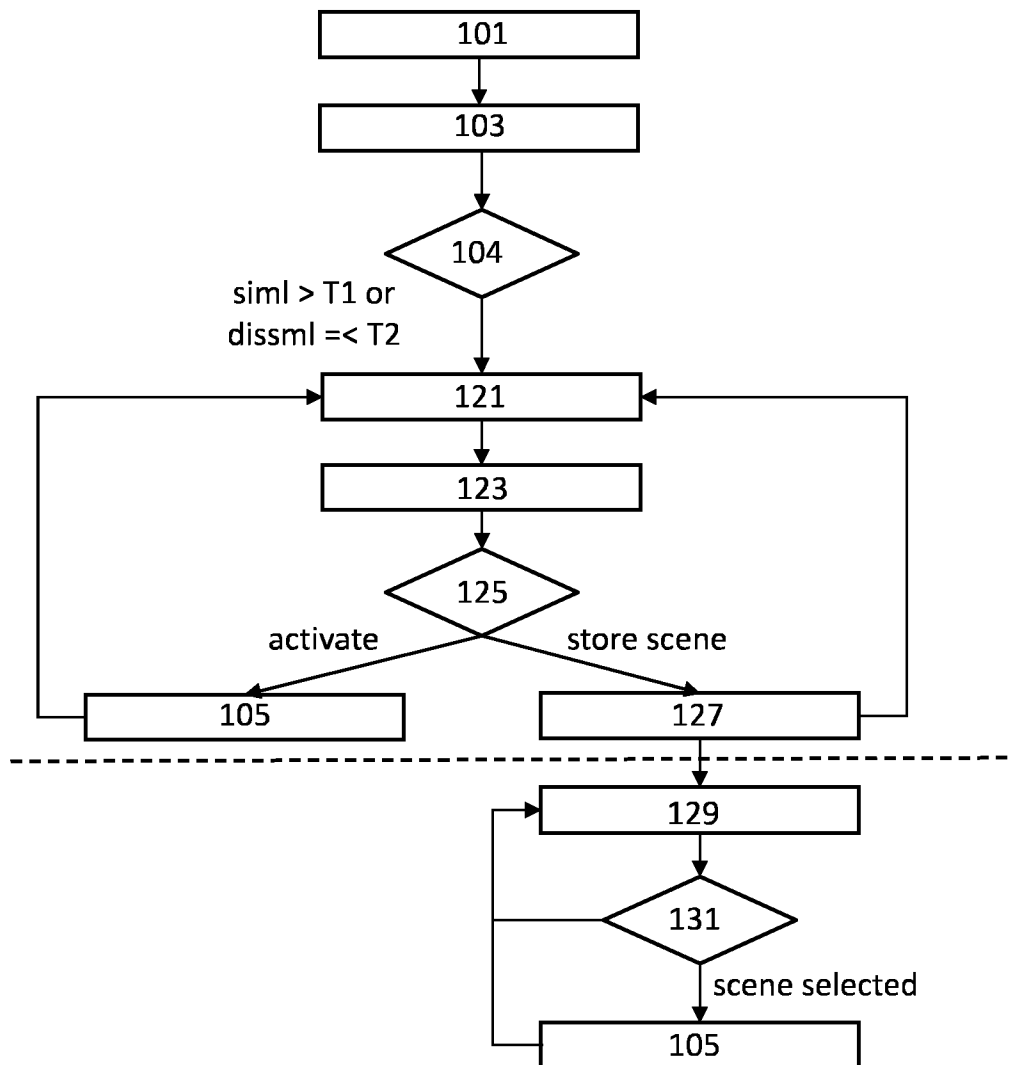


Fig. 3

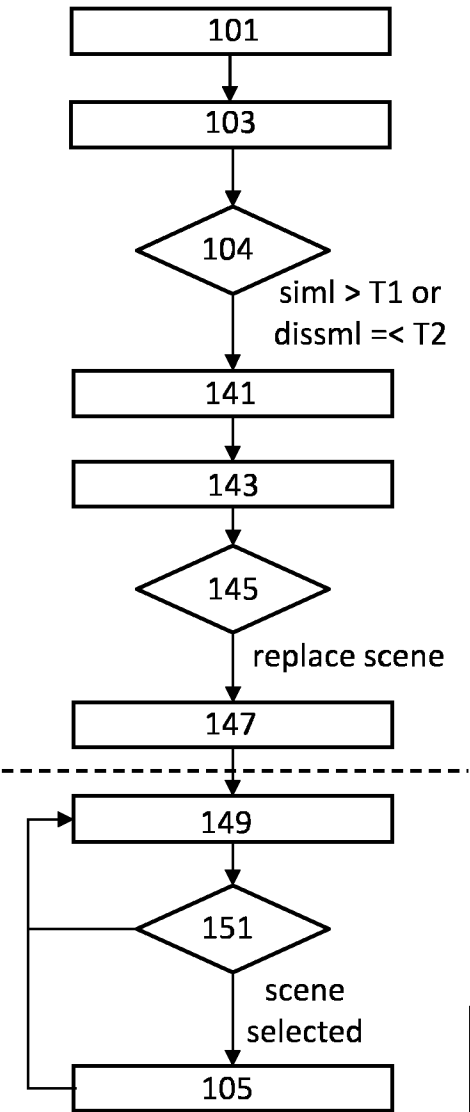


Fig. 4

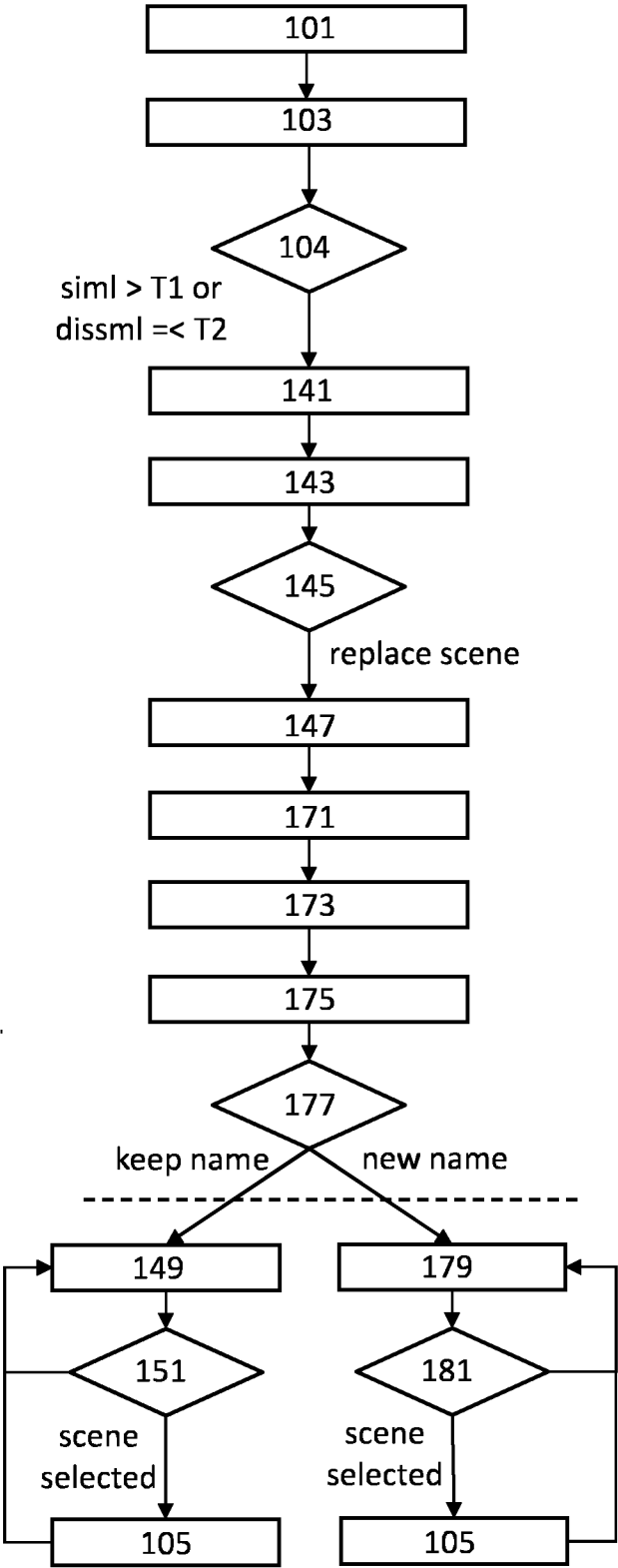


Fig. 5

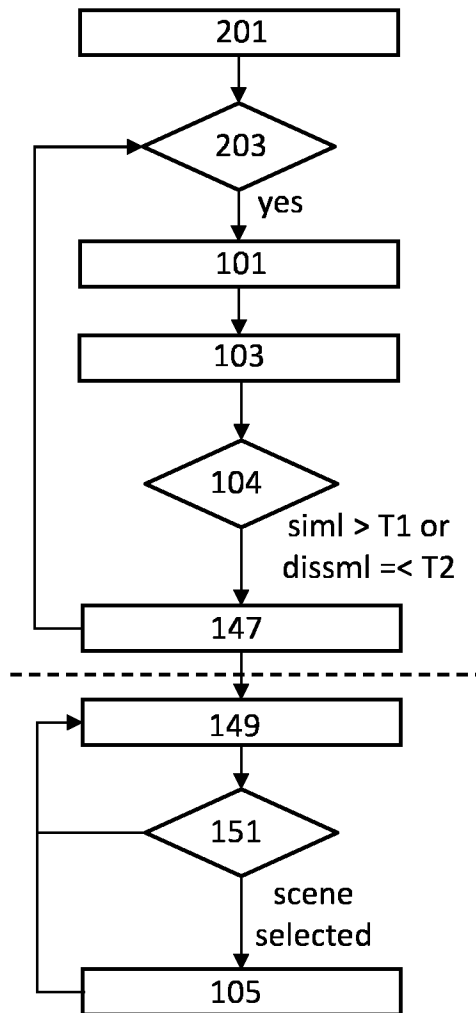


Fig. 6

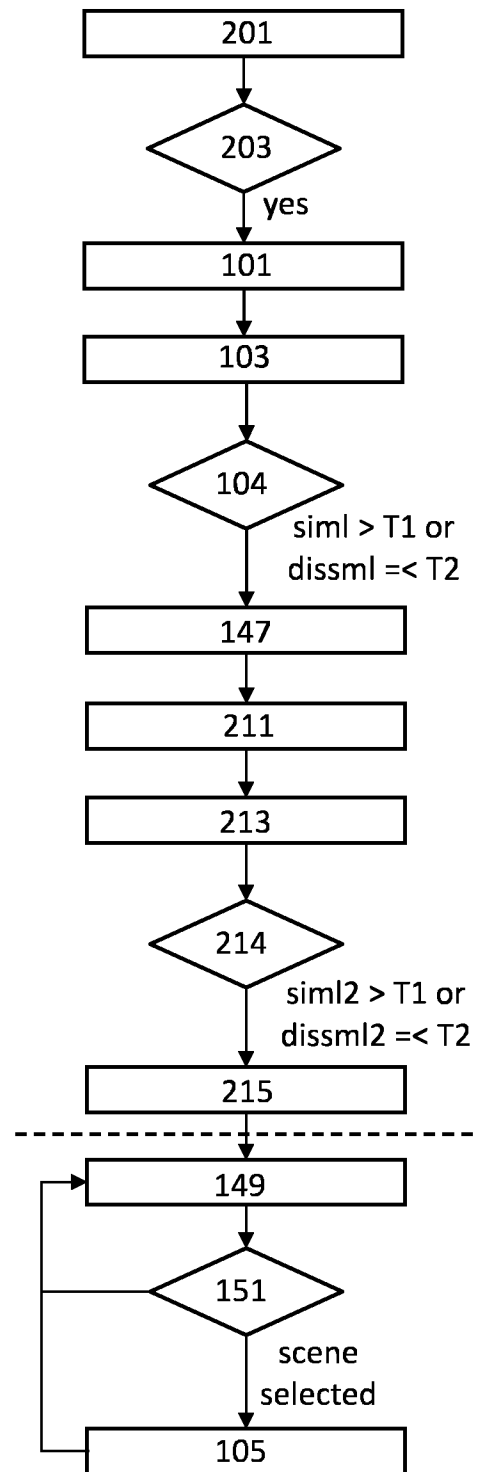


Fig. 7

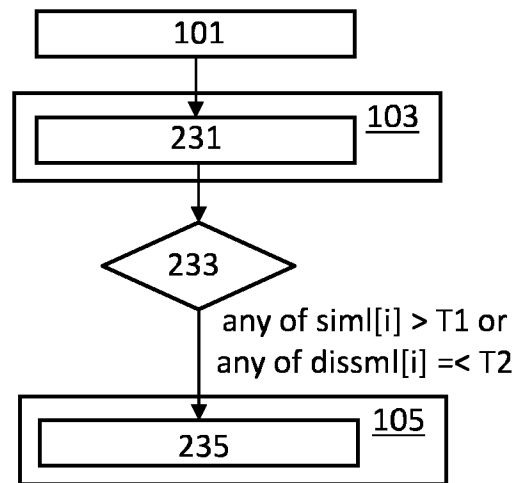


Fig. 8

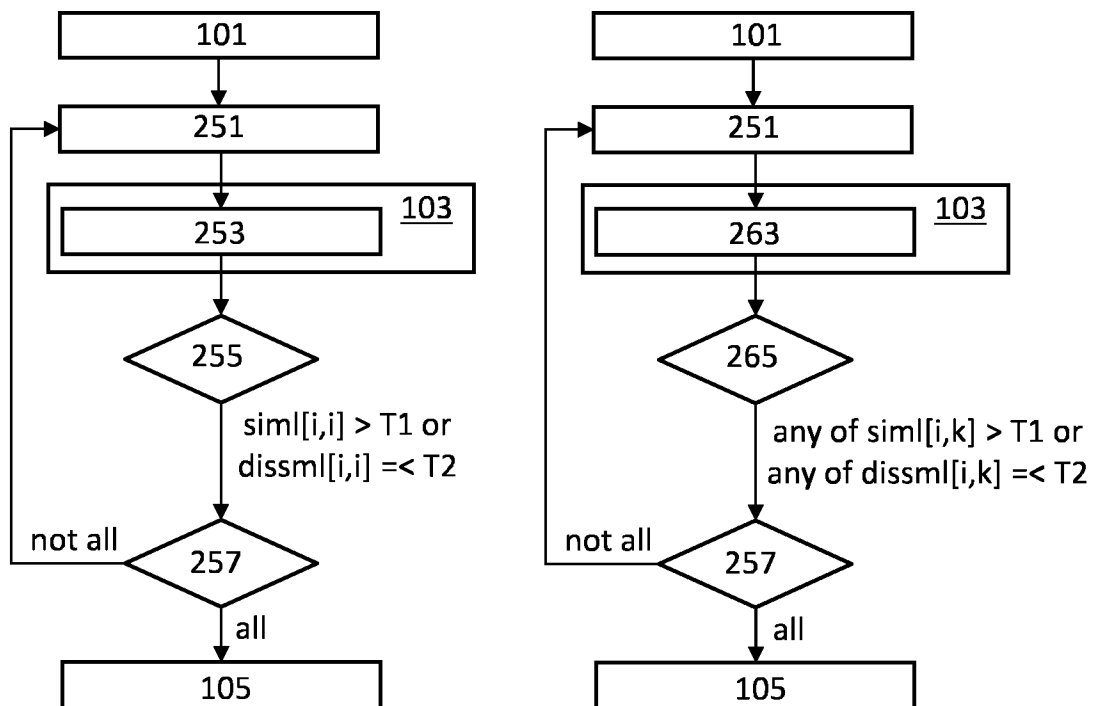


Fig. 9

Fig. 10

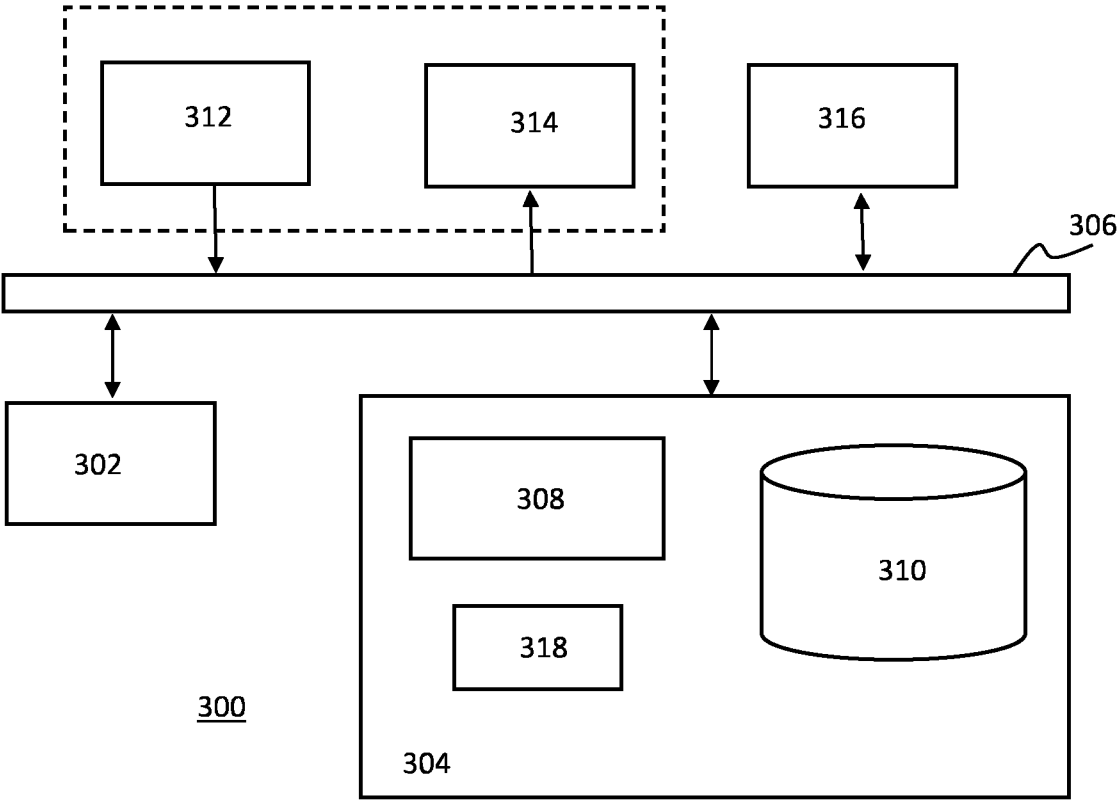


Fig. 11

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/076614

A. CLASSIFICATION OF SUBJECT MATTER INV. H05B47/105 H05B47/155 H05B47/19 H05B47/175 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) H05B 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		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010/251157 A1 (WENDT MATTHIAS [DE] ET AL) 30 September 2010 (2010-09-30) paragraph [0064] - paragraph [0078]; figure 1 -----	1 - 14
☐ 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" 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 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 12 December 2024		Date of mailing of the international search report 03/01/2025
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Beaugrand, Francois

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2024/076614

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