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(54) **MOBILE DEVICE USER INTERFACE HAVING ENHANCED VISUAL CHARACTERISTICS**

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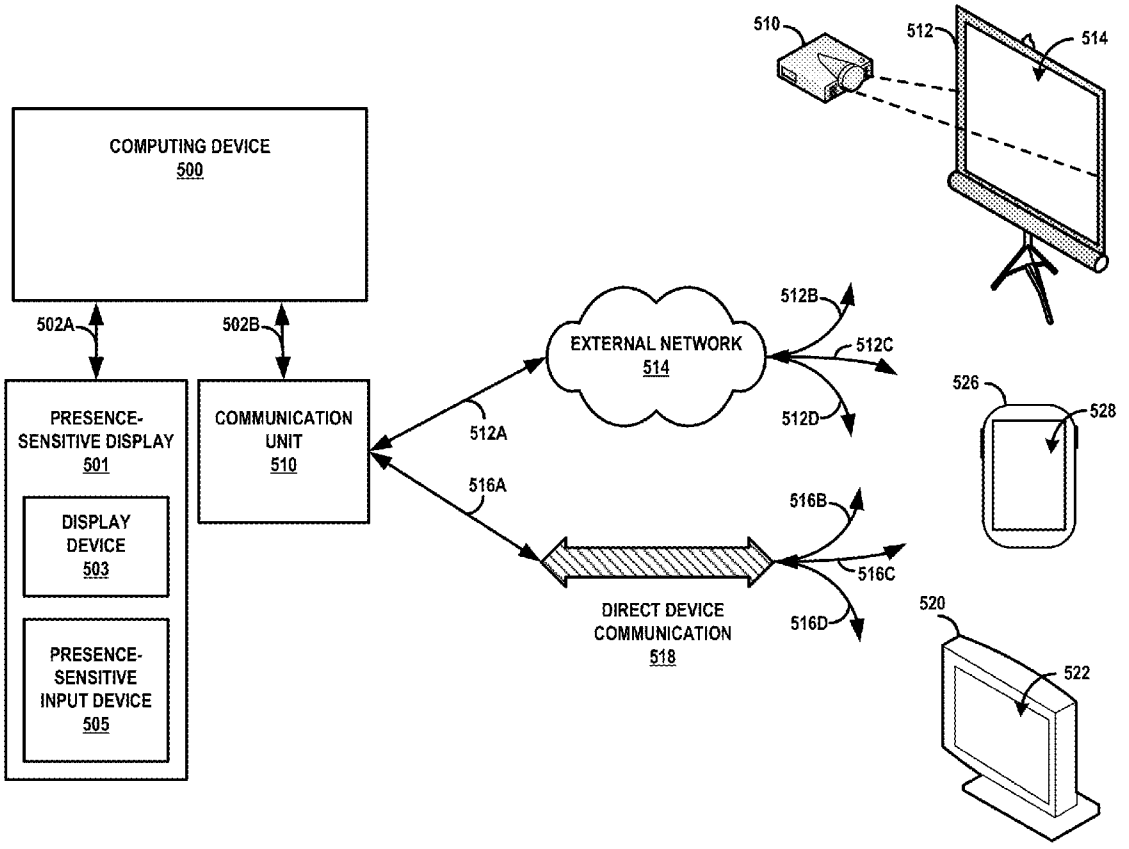
USPC **345/589**

(57) **ABSTRACT**

A computing device includes a user interface module operable by at least one processor to output, for display, a graphical user interface of an application, the graphical user interface including a plurality of elements, each respective element of the plurality of elements being associated with one of a plurality of application features, determine an age for a first application feature of the plurality of application features, the age being a period of time that has elapsed since the first application feature was enabled in the application, generate, based on the age, a visual characteristic that modifies at least one of a chrominance value and a luminance value associated with a first element of the plurality of elements associated with the first application feature, and output, for display, the visual characteristic.



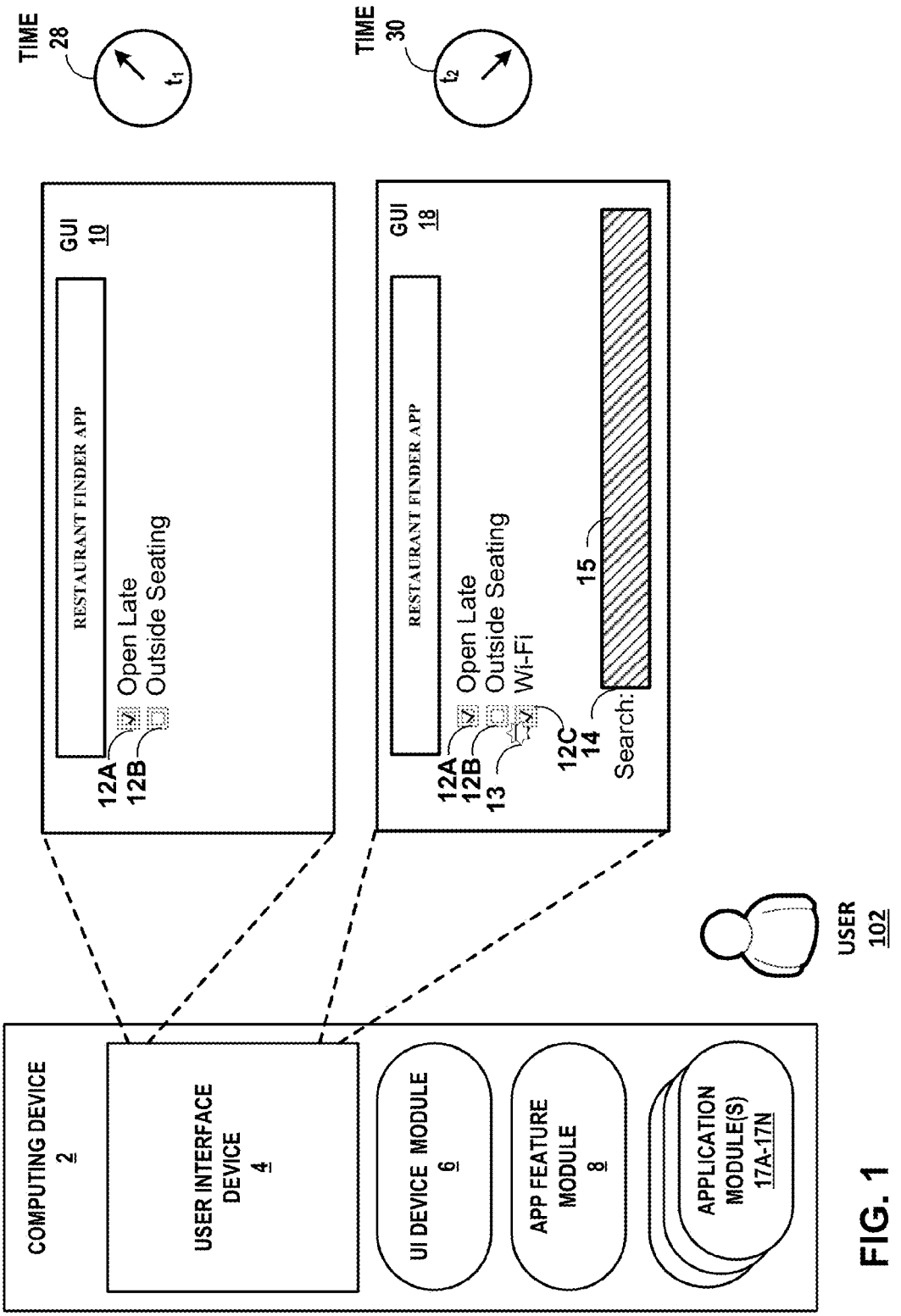

TIME
28
t_1
TIME
30
t_2
GUI
10
RESTAURANT FINDER APP
Open Late
Outside Seating
12A
12B
GUI
18
RESTAURANT FINDER APP
Open Late
Outside Seating
Wi-Fi
12A
12B
13
12C
14
Search:
15
USER
102
COMPUTING DEVICE
2
USER INTERFACE DEVICE
4
UI DEVICE MODULE
6
APP FEATURE MODULE
8
APPLICATION MODULE(S)
17A-17N

FIG. 1

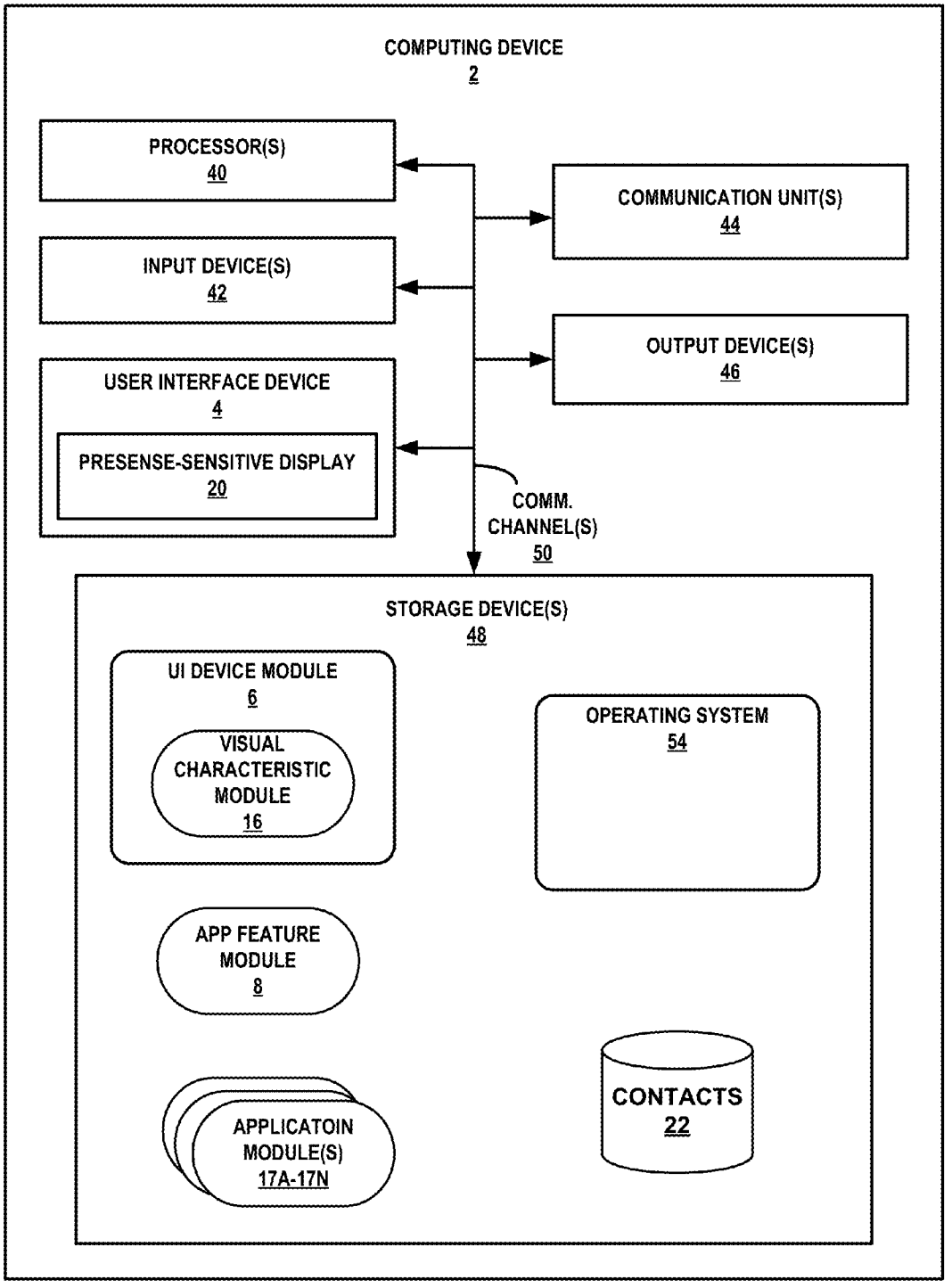

COMPUTING DEVICE
2
PROCESSOR(S)
40
COMMUNICATION UNIT(S)
44
INPUT DEVICE(S)
42
OUTPUT DEVICE(S)
46
USER INTERFACE DEVICE
4
PRESENSE-SENSITIVE DISPLAY
20
COMM.
CHANNEL(S)
50
STORAGE DEVICE(S)
48
UI DEVICE MODULE
6
VISUAL
CHARACTERISTIC
MODULE
16
OPERATING SYSTEM
54
APP FEATURE
MODULE
8
CONTACTS
22
APPLICATOIN
MODULE(S)
17A-17N

FIG. 2

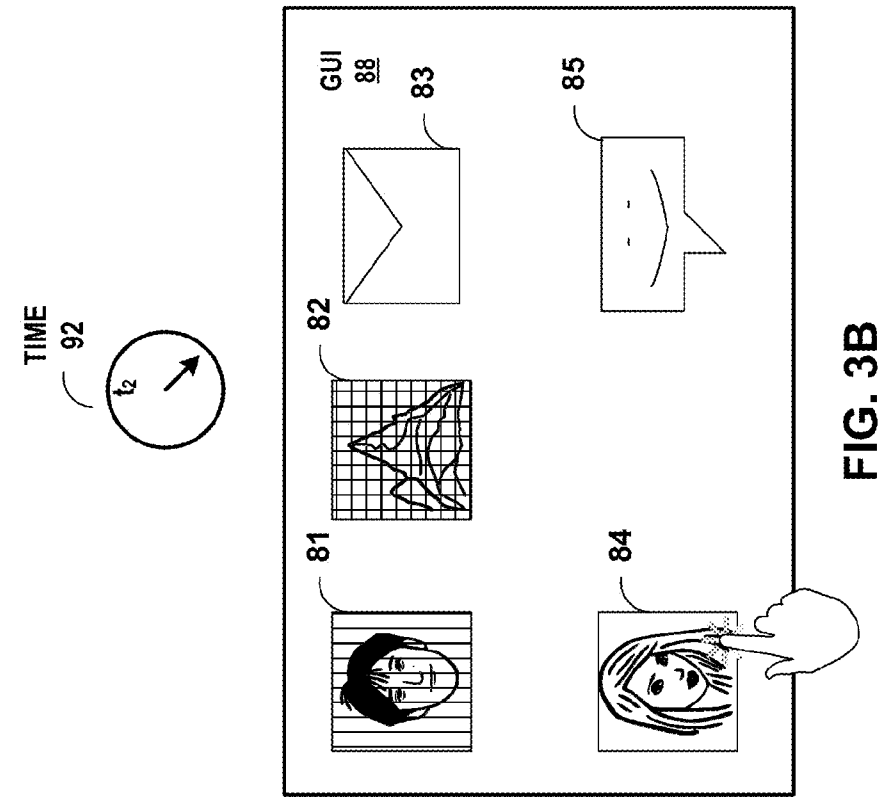


FIG. 3B

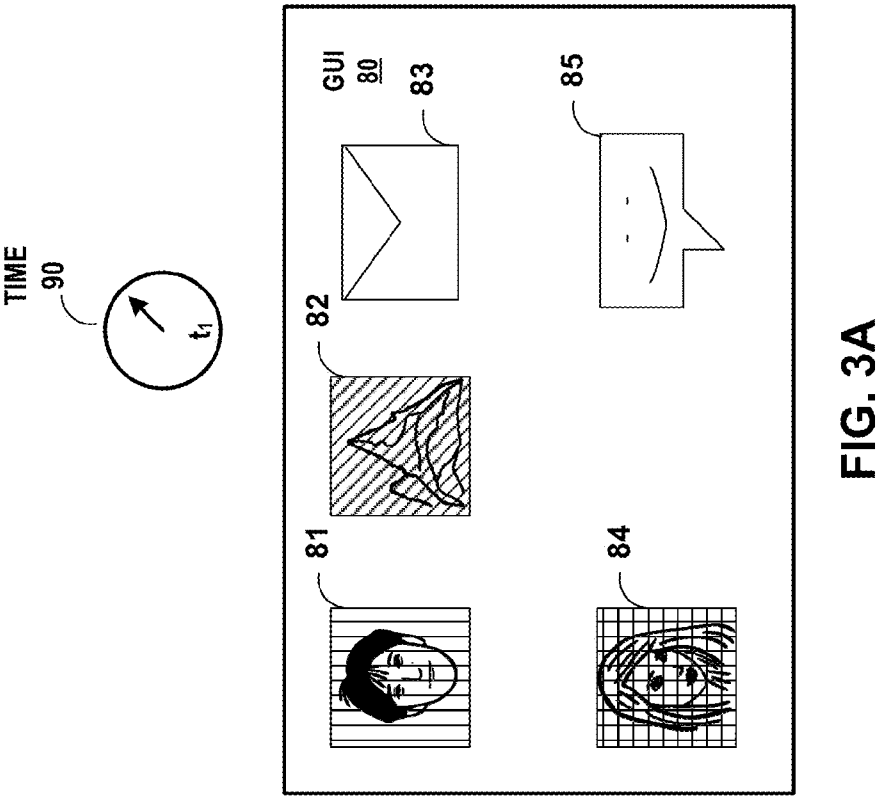


FIG. 3A

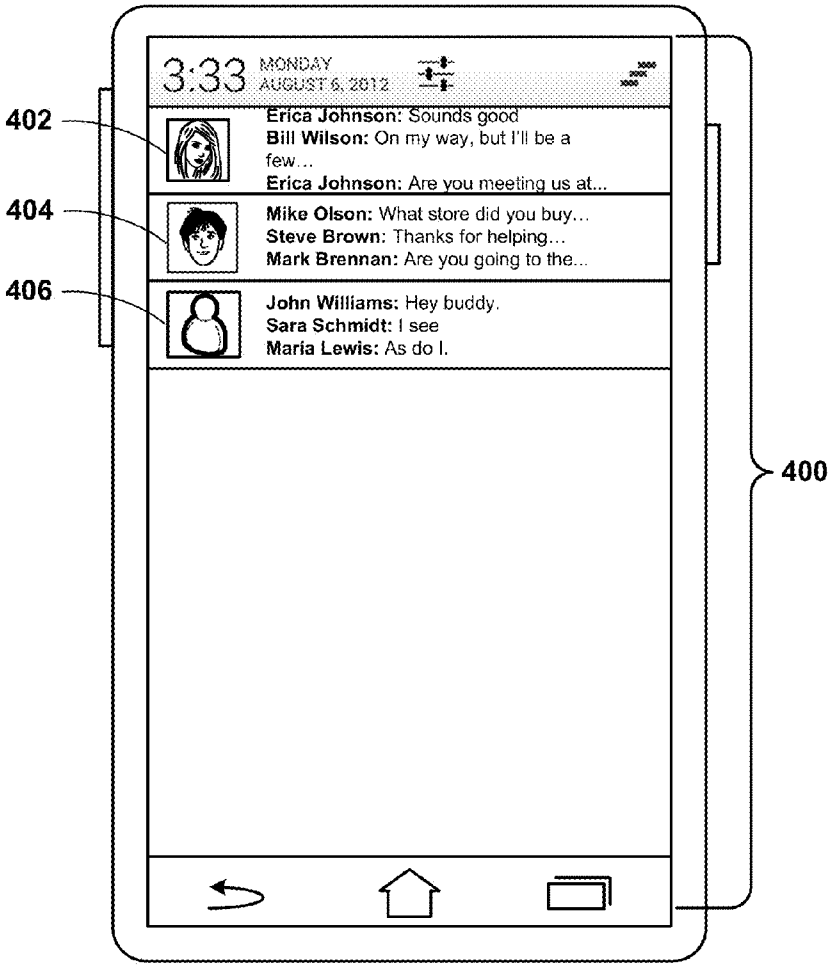

3:33
MONDAY
AUGUST 6, 2012
Erica Johnson: Sounds good
Bill Wilson: On my way, but I'll be a few…
Erica Johnson: Are you meeting us at...
Mike Olson: What store did you buy…
Steve Brown: Thanks for helping…
Mark Brennan: Are you going to the...
John Williams: Hey buddy.
Sara Schmidt: I see
Maria Lewis: As do I.
402
404
406
400

FIG. 4

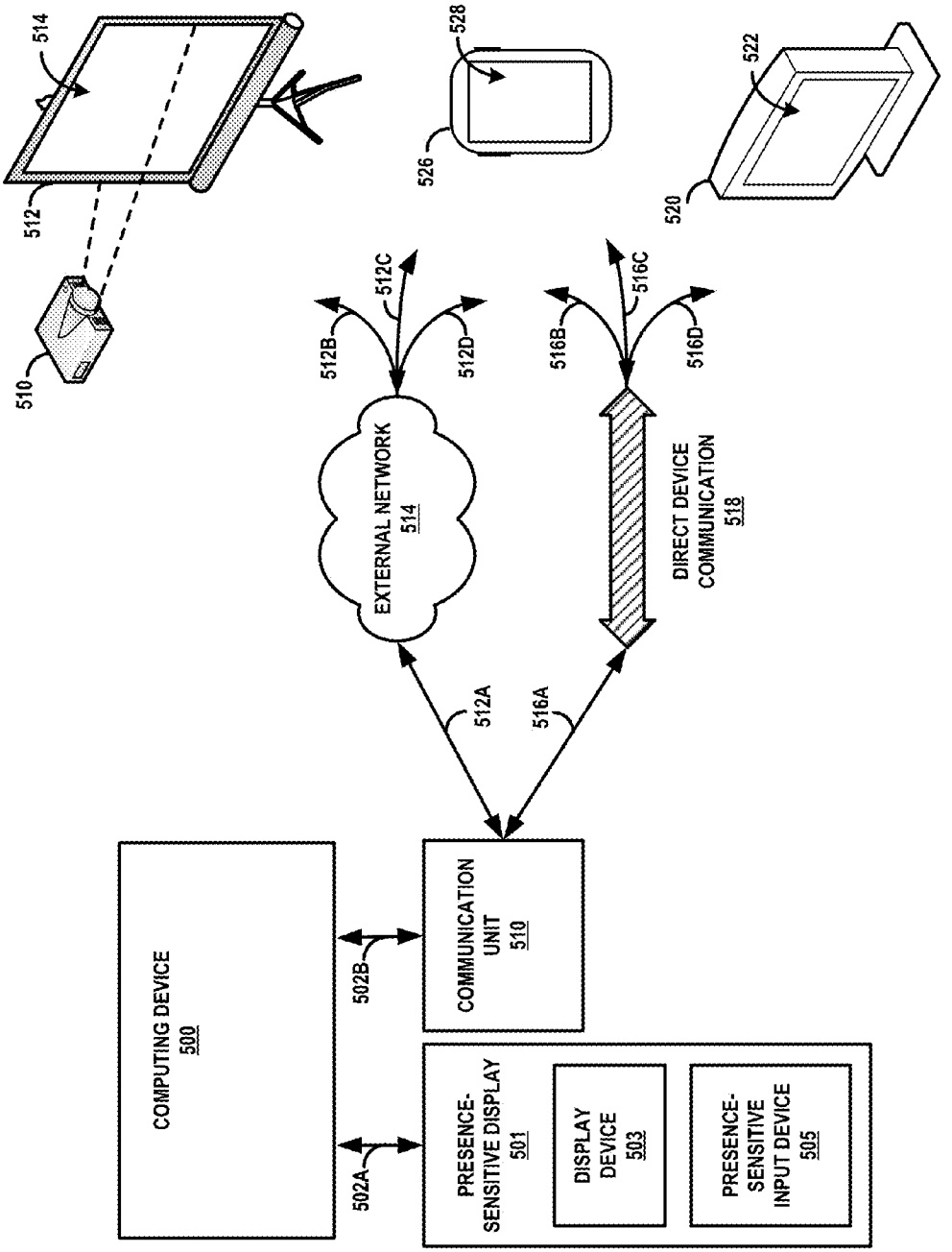

514
512
510
528
526
522
520
512B
512C
512D
516B
516C
516D
EXTERNAL NETWORK
514
DIRECT DEVICE
COMMUNICATION
518
512A
516A
COMPUTING DEVICE
500
502B
COMMUNICATION
UNIT
510
502A
PRESENCE-
SENSITIVE DISPLAY
501
DISPLAY
DEVICE
503
PRESENCE-
SENSITIVE
INPUT DEVICE
505

FIG. 5

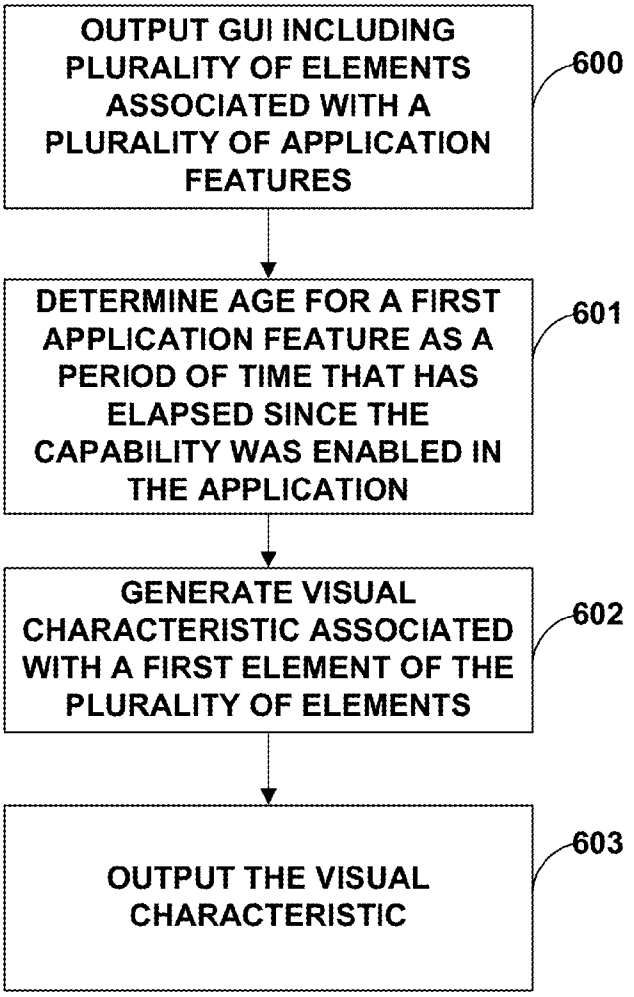

OUTPUT GUI INCLUDING PLURALITY OF ELEMENTS ASSOCIATED WITH A PLURALITY OF APPLICATION FEATURES
600
DETERMINE AGE FOR A FIRST APPLICATION FEATURE AS A PERIOD OF TIME THAT HAS ELAPSED SINCE THE CAPABILITY WAS ENABLED IN THE APPLICATION
601
GENERATE VISUAL CHARACTERISTIC ASSOCIATED WITH A FIRST ELEMENT OF THE PLURALITY OF ELEMENTS
602
OUTPUT THE VISUAL CHARACTERISTIC
603

FIG. 6

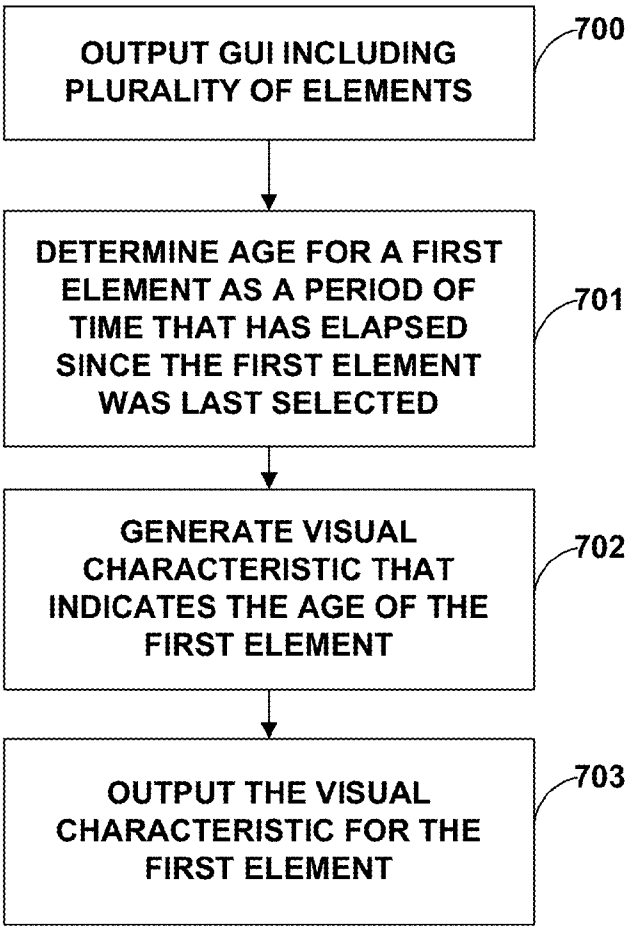

OUTPUT GUI INCLUDING PLURALITY OF ELEMENTS
700
DETERMINE AGE FOR A FIRST ELEMENT AS A PERIOD OF TIME THAT HAS ELAPSED SINCE THE FIRST ELEMENT WAS LAST SELECTED
701
GENERATE VISUAL CHARACTERISTIC THAT INDICATES THE AGE OF THE FIRST ELEMENT
702
OUTPUT THE VISUAL CHARACTERISTIC FOR THE FIRST ELEMENT
703

FIG. 7

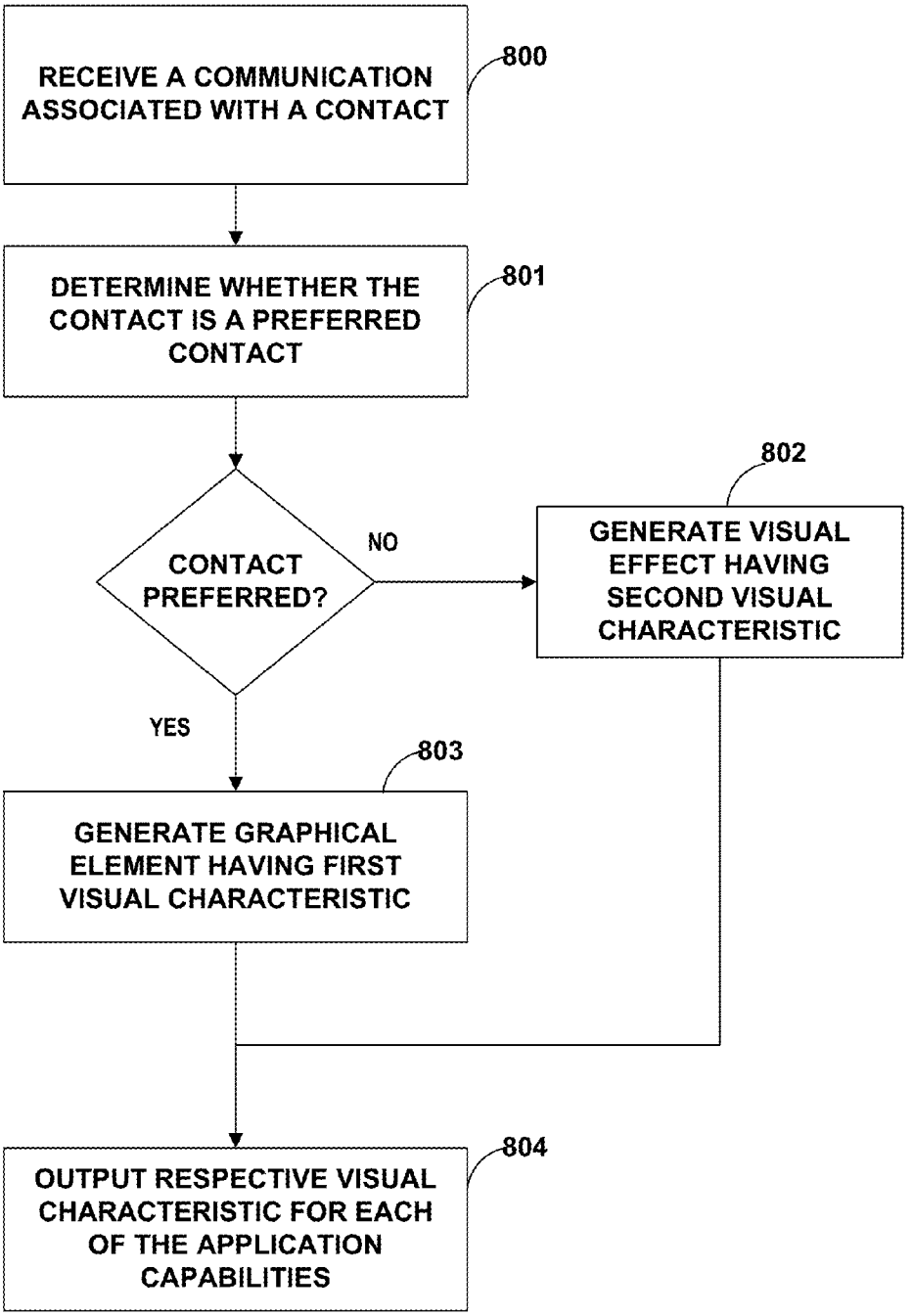

RECEIVE A COMMUNICATION ASSOCIATED WITH A CONTACT
800
DETERMINE WHETHER THE CONTACT IS A PREFERRED CONTACT
801
CONTACT PREFERRED?
NO
YES
802
GENERATE VISUAL EFFECT HAVING SECOND VISUAL CHARACTERISTIC
803
GENERATE GRAPHICAL ELEMENT HAVING FIRST VISUAL CHARACTERISTIC
804
OUTPUT RESPECTIVE VISUAL CHARACTERISTIC FOR EACH OF THE APPLICATION CAPABILITIES

FIG. 8

MOBILE DEVICE USER INTERFACE HAVING ENHANCED VISUAL CHARACTERISTICS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 13/854,806, filed Apr. 1, 2013, which claims the benefit of U.S. provisional application No. 61/714,680, filed Oct. 16, 2012, and U.S. provisional application No. 61/789,029, filed on Mar. 15, 2013, the entire content of each of which is incorporated herein by reference.

BACKGROUND

[0002] Mobile computing devices, such as mobile phones and tablet computers, are becoming increasingly powerful and ubiquitous, and applications for these computerized devices have begun to offer extensive functionality. Many of these mobile computing devices are provided with several pre-installed applications (often referred to as "apps") that offer at least a basic set of functions (e.g., telephony, photo capture, web browsing, email, and navigation). In addition, numerous such apps are available for downloaded and installation from online app stores or markets.

[0003] As the functionality of mobile computing devices and applications executable thereby has expanded, so has the importance of the user interface in ensuring a lightweight and intuitive mechanism for providing input to and receiving feedback from the mobile computing device.

SUMMARY

[0004] In one aspect, the disclosure describes a method that includes outputting, by a computing device and for display, a graphical user interface of an application, the graphical user interface including a plurality of elements, each respective element of the plurality of elements being associated with one of a plurality of features, determining, by the computing device, an age for a first application feature of the plurality of application features, the age being a period of time that has elapsed since the first application feature was enabled in the application, generating, by the computing device, based on the age, a visual characteristic that modifies at least one of a chrominance or luminance value associated with a first element of the plurality of elements associated with the first application feature, and outputting, by the computing device and for display, the visual characteristic.

[0005] In another aspect, this disclosure describes a method that includes outputting, by a computing device for display, a graphical user interface of an application, the graphical user interface including a plurality of elements, determining, by the computing device, an age for a first element of the plurality of elements, the age being a period of time that has elapsed since the first element was last selected in the application, generating, by the computing device, based on the age of the first element, a visual characteristic that modifies at least one of chrominance or luminance value indicating the age of the first element, and outputting, by the computing device for display, the visual characteristic for the first element.

[0006] In another aspect, the disclosure describes a computing device that includes at least one processor, and a user interface module operably by the at least one processor. In accordance with this aspect of the disclosure, the user interface module may be operable by the at least one processor to output, for display, a graphical user interface of an application, the graphical user interface including a plurality of elements, each respective element of the plurality of elements being associated with one of a plurality of features, determine an age for a first application feature of the plurality of application features, the age being a period of time that has elapsed since the first application feature was enabled in the application, generate, based on the age, a visual characteristic that modifies at least one of a chrominance value and a luminance value associated with a first element of the plurality of elements associated with the first application feature, and output, for display, the visual characteristic.

[0007] In another example, A device includes at least one processor and a user interface module operable by the at least one processor. The user interface module is operable by the at least one processor to output for display at a display device, a graphical user interface of an application including a plurality of elements, each respective element of the plurality of elements being associated with one of a plurality of features, determine an age for a first application feature of the plurality of application features, the age being a period of time that has elapsed since the first application feature was enabled in the application, generate, based on the age, a visual characteristic that modifies at least one of a respective chrominance or luminance value associated with a first element of the plurality of elements associated with the first application feature, and output for display, the visual characteristic.

[0008] The details of one or more examples are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the disclosure will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF DRAWINGS

[0009] FIG. **1** is a conceptual diagram illustrating an example computing device that generates and outputs enhanced visual characteristics based on various factors in accordance with one or more aspects of the present disclosure.

[0010] FIG. **2** is a block diagram illustrating an example computing device, in accordance with one or more aspects of the present disclosure.

[0011] FIGS. **3**A-**3**B are conceptual diagrams that illustrate visual characteristics associated with user interface elements based on a period of time since a user has interacted with the user interface elements, in accordance with one or more aspects of the present disclosure.

[0012] FIG. **4** is a conceptual diagram that illustrates generating and outputting enhanced visual characteristics associated with a user interface elements that represent one or more contacts, in accordance with one or more aspects of the present disclosure.

[0013] FIG. **5** is a block diagram illustrating an example computing device that outputs graphical content for display at a remote device, in accordance with one or more techniques of the present disclosure.

[0014] FIG. **6** is a flow diagram illustrating an example operation of the computing device, in accordance with one or more aspects of the present disclosure.

[0015] FIG. **7** is a flow diagram illustrating an example operation of the computing device, in accordance with one or more aspects of the present disclosure.

[0016] FIG. **8** is a flow diagram illustrating an example operation of the computing device, in accordance with one or more aspects of the present disclosure.

DETAILED DESCRIPTION

[0017] This disclosure describes techniques for constructing and outputting, from a computing device, a graphical user interface (GUI) in which interface elements have enhanced visual characteristics based on various factors. The enhanced visual characteristics may improve the experience of a user of the computing device by drawing the attention of the user to particular interface elements and, for example, by providing an indication, based on the associated visual characteristic, of a classification of each of the user interface elements.

[0018] As one example, a computing device may construct and output user interface elements for an application having visual characteristics indicative of an "age" (e.g., an amount of time since the installation or receipt by the device) of one or more capabilities or features of the application. As a result, a user may be able to more readily distinguish "newer" apps and/or application features from "older" apps and/or application features.

[0019] As a second example, the computing device may output user interface elements for an application having visual characteristics based on an amount of time elapsed since a most-recent user selection of or interaction with the respective user interface element. In some instances, the respective user interface element may be associated with a particular capability or feature of application. In this manner, the visual characteristics may provide an indication of application features and associated user interface elements which the user has not recently used or with which the user has not recently interacted. Such visual characteristics may signal to a user which application features are most-frequently used, and thereby more easily identify any unused features of the application.

[0020] FIG. **1** is a conceptual diagram illustrating an example computing device that generates and outputs enhanced visual characteristics based on various factors in accordance with one or more aspects of the present disclosure. In the example of FIG. **1**, computing device **2** may be a mobile phone. However, in other examples, computing device **2** may be a personal digital assistant (PDA), a desktop computer, a laptop computer, a tablet computer, a portable gaming device, a portable media player, a camera, an e-book reader, a watch, or another type of computing device. Moreover, computing device **2** may include one or more standalone devices or may be part of a larger system. User **102** interacts with computing device **2** using various input and output devices, examples of which are shown in greater detail in FIG. **2**.

[0021] In the example shown in FIG. **1**, computing device **2** includes a user interface device (UID) **4**, user interface device module **6** (UI device module **6**), application feature module **8**, and application modules **17**A-**17**N. User **102** may be associated with computing device, **2**, and may perform various actions, described in further detail below, using computing device **2**.

[0022] UID **4** of computing device **2** may function as an input device and/or an output device for computing device **2**. For example, UID **4** of computing device **2** may include a presence-sensitive display, such as a touchscreen configured to receive tactile user input from a user of computing device **2**. UID **4** may receive tactile user input as one or more taps and/or gestures. UID **4** may detect taps or other gestures in response to the user touching or pointing to one or more locations of UID **4** with a finger or a stylus pen. UID **4** may be implemented using various technologies. For example, UID **4** may be implemented using a resistive touchscreen, a surface acoustic wave touchscreen, a capacitive touchscreen, a projective capacitance touchscreen, a pressure sensitive screen, an acoustic pulse recognition touchscreen, or another presence-sensitive display technology. Furthermore, UID **4** may include any one or more of a liquid crystal display (LCD) dot matrix display, light emitting diode (LED) display, organic light-emitting diode (OLED) display, e-ink, or similar monochrome or color display capable of outputting visible information to user **102** of computing device **2**.

[0023] UID **4** may output a graphical user interface (GUI), such as GUI **10** and GUI **18**, which may be related to functionality provided by computing device **2**. For example, UID **4** may output GUI **10** and GUI **18**, which are associated with one or more of application modules **17**A-**17**N, and which are described in further detail below.

[0024] UI device module **6** may comprise hardware or software that interacts with and/or controls UID **4**, and which manages the layout and user interaction associated with elements of a GUI. As an example, UI device module **6** may comprise one or more graphics processing units (GPUs), drivers, software, and/or firmware that may control the output and input from UID **4**. UI device module **6** may also manage the layout and user interaction with the elements of a user interface, such as GUI **10** and GUI **18**, which application modules **17**A-**17**N may generate. In some examples, UI device module **6** may also generate and output enhanced visual characteristics, which may modify luminance and/or chrominance values associated with elements of the user interface based on various factors in accordance with the techniques of this disclosure.

[0025] Application modules **17**-**17**N ("application modules **17**") represent one or more applications of computing device **2**. As some examples, application modules **17** may include a restaurant finder application, a contact management application, which may allow interaction with contacts associated with user **102**, for example using text messaging (e.g., SMS or MMS messaging), voice, and video communications. Application modules **17** may also include various applications that user **102** may download and install from an application store or marketplace. User **102** or computing device **2** may update the version or capabilities of one or more of application modules **17**. In some examples, the updated applications may include new application capabilities, also referred to herein as software features, which application feature module **8** may monitor.

[0026] More specifically, application feature module **8** may monitor installation and usage of individual capabilities provided by application modules **17**. In some examples, application feature module **8** may track when new application capabilities are added to each of application modules **17**, e.g., by way of a software update. As part of tracking application capabilities, application feature module **8** may determine a date and/or timestamp associated with one or more capabilities of each of application modules **17**. Based on the date associated with each application capability, application feature module **8** may determine a visual characteristic for a user interface element associated with that application capability, and UID **4** may output the visual characteristics in accordance with the techniques of this disclosure. In some examples, the

visual effects may modify luminance and/or chrominance values associated with elements of the user interface elements. Although shown separately from application modules **17**, application feature module **8** may be a component or module integrated within one or more of application modules **17** or within an operating system or other software component of computing device **2**.

[0027] In the example of FIG. **1**, one of application modules **17** (e.g., application module **17**A) may generate GUI **10** and GUI **18** at time (t_1) **28** and time (t_1) **30**, respectively. When constructing and outputting GUIs **10**, **18**, application feature module **8** may determine a respective date (e.g., a timestamp) associated with installation of one or more capabilities of the one of application modules **17**, and UID **4** may output user interface elements of GUIs **10**, **18** associated with the capabilities to have certain visual characteristics based on the respective dates. In a second example, when constructing GUIs **10**, **18**, application feature module **8** may determine an age since a user has selected a particular UI element generated by one of application modules **17**, and UID **4** may control the visual characteristics for each UI element based on the age

[0028] As a more detailed illustration of the first example of outputting enhanced visual characteristics, user **102** may, at a time (t_0), download and install a restaurant finder application which may include UI elements that are associated with the enhanced visual characteristics. The restaurant application may comprise one of application modules **17**, which subsequently cause UID **4** to output GUI **10** at a time (t_1) **28** to include user interface elements **12**A, and **12**B. User interface elements **12**A and **12**B may be associated with application capabilities that allow user **102** to search for restaurants with various characteristics. Moreover, application feature module **8** determines an age of each of features to which user interface elements **12**A and **12**B correspond, where the age the feature represents a period of time that has elapsed since the application capability was made available by the software application, either at the time of original installation or software upgrade. Assuming the capabilities associated with user interface elements **12**A and **12**B are originally present in the restaurant finder application when user **102** installed the restaurant finder application, the age of the capabilities of user interface elements **12**A and **12**B is the time between the installation of the restaurant finder application at time at a time (t_0) and the time (t_1) **28** when GUI **10** was constructed.

[0029] At a later time (t_2) **30**, user interface device **4** outputs GUI **18**. In between time **28** and time **30**, computing device **2** may update the restaurant finder application to a different version of the application having new capabilities. As an example, GUI **18** may include UI elements **12**A and **12**B which were present in GUI **10**, but further includes UI element **12**C, and UI element **14**. In this example, both UI element **12**C and UI element **14** are associated with new application capabilities. For example, element **12**C may be associated with a capability that allows user **102** to search for restaurants that have Wi-Fi, and UI element **14** may be associated with a search capability that may allow user **102** to search for restaurants, e.g., based on a textual description of the restaurant. When computing device **2** generates GUI **18**, UI device module **6** may construct UI elements **12**C, **14** for the new software features so as to have one or more visual characteristics that are indicative of the age of the capabilities. In this example, computing device **2** has output GUI **18** such that UI element **12**C associated with the new Wi-Fi property capability has enhanced visual characteristic **13** and UI element **14** associated with the text search capability has enhanced visual characteristic **15**. As a result, a user **102** may be able to more readily distinguish newer application features associated with UI elements **12**C, **14** from older application features based on the visual characteristics **13**, **15**.

[0030] As a more detailed illustration of the second example described above, application feature module **8** may determine an age associated with UI elements based on the time since user **102** last selected each element, and based on the age of each UI element, UID **4** may output a visual characteristic indicative of the age associated with each UI element. In the example of FIG. **1**, user **102** may select UI element **12**A at time (t_1) **28**, but may not have selected UI element **12**B. Application feature module **28** may determine an age associated with UI elements **12**A and **12**B based on the times at which UI elements **12**A and **12**B were last selected. Accordingly, the age of UI element **12**A may be older than the age of UI element **12**B. As a result, UI device module **6** may generate, and UID **4** may output, UI elements **12**A and **12**B of GUI **18** to have visual characteristics indicative of this age difference. In some examples, the enhanced visual characteristics, may modify luminance and/or chrominance values associated with elements, e.g., of UI elements **12**A and **12**B based on various factors in accordance with the techniques of this disclosure. At time (t_1) **30**, for example, UID **4** may display UI element **12**A to have a first visual characteristic, and the first visual characteristic may differ from a second visual characteristic that is associated with UI element **12**B, based on the different ages of UI elements **12**A and **12**B. For example, UI element **12**A may be displayed with certain shading and rendering indicative of an older object, such as a texturing that visually simulates a brittle or fragile state. Alternatively, or in addition, UI element **12** having a newer age may be rendered with bright, clean lines. In this way, user **102** may more easily access and utilize more frequently used features and may more easily identify any unused features of the software application, for example.

[0031] As described above, computing device **2** may output enhanced visual characteristics based on various factors in accordance with the techniques of this disclosure. The enhanced visual characteristics may enhance the experience of a user, such as user **102**, of computing device **2**, by drawing the attention of the user to the interface elements that are associated with the improved visual effects.

[0032] FIG. **2** is a block diagram illustrating an example computing device, in accordance with one or more aspects of the present disclosure. Computing device **2** of FIG. **2** is described below within the context of FIG. **1**. As shown in the example of FIG. **2**, computing device **2** includes user interface device **4** ("UID **4**"), one or more processors **40**, one or more input devices **42**, one or more communication units **44**, one or more output devices **46**, and one or more storage devices **48**. In this example, UID **4** also includes presence-sensitive display **20**.

[0033] Storage devices **48** of computing device **2** may also include user interface module **6**, application feature module **8**, application modules **17**A-**17**N, visual characteristic module **16**, contacts **22**, and operating system **54**. Communication channels **50** may interconnect each of the components **6**, **8**, **16**, **17**, **20**, **22**, **40**, **42**, **44**, **46**, **48**, and **54** for inter-component communications (physically, communicatively, and/or operatively). In some examples, communication channels **50**

may include a system bus, a network connection, an interprocess communication data structure, or any other method for communicating data.

[0034] One or more input devices **42** of computing device **2** may receive input. Examples of input are tactile, audio, and video input. Input devices **42** of computing device **2**, in one example, includes a presence-sensitive display (e.g., presence-sensitive display **20**), touch-sensitive screen, mouse, keyboard, voice responsive system, video camera, microphone, accelerometer, gyroscope, light sensor, or any other type of device for detecting input from a human or machine.

[0035] One or more output devices **46** of computing device **2** may generate output. Examples of output are tactile, audio, and video output. Output devices **46** of computing device **2**, in one example, includes a presence-sensitive display, sound card, video graphics adapter card, speaker, cathode ray tube (CRT) monitor, liquid crystal display (LCD), or any other type of device for generating output to a human or machine.

[0036] One or more communication units **44** of computing device **2** may communicate with external devices via one or more networks by transmitting and/or receiving network signals on the one or more networks. For example, computing device **2** may use communication unit **44** to transmit and/or receive radio signals on a radio network such as a cellular radio network. Likewise, communication units **44** may transmit and/or receive satellite signals on a satellite network such as a GPS network. Examples of communication unit **44** include a network interface card (e.g. such as an Ethernet card), an optical transceiver, a radio frequency transceiver, a GPS receiver, or any other type of device that can send and/or receive information. Other examples of communication units **44** may include Bluetooth®, GPS, 3G, 4G, and Wi-Fi® radios found in mobile devices as well as Universal Serial Bus (USB) controllers.

[0037] UID **4** of FIG. **2** includes presence-sensitive display **20** (hereafter "display **20**"). Computing device **2** may use display **20** as an input device and an output device. For example, display **20** of UID **4** may include a touchscreen configured to receive tactile user input from a user of computing device **2**. Display **20** of UID **4** may also include an LED display capable of outputting visible information to the user of computing device **2**. UID **4** may present a user interface on display **20**, such as GUIs **10**, **14** of FIG. **1**, that may be related to functionality provided by computing device **2**. In some examples, display **20** of UID **4** may present various functions and applications, such as an electronic message client, a contacts GUI, and a notifications GUI.

[0038] One or more storage devices **48** within computing device **2** may store information required for use during operation of computing device **2** (e.g., application modules **17** of computing device **2** may store information related to operation of the respective one of one or more applications). Storage devices **48**, in some examples, have the primary purpose of being short term and not long-term computer-readable storage mediums. Storage devices **48** on computing device **2** may be configured for short-term storage of information as volatile memory and therefore not retain stored contents if powered off. Examples of volatile memories include random access memories (RAM), dynamic random access memories (DRAM), static random access memories (SRAM), and other forms of volatile memories known in the art. Storage devices **48** may further be configured for long-term storage of information as non-volatile memory space and retain information after power on/off cycles. Examples of non-volatile memories include magnetic hard discs, optical discs, floppy discs, flash memories, or forms of electrically programmable memories (EPROM) or electrically erasable and programmable (EEPROM) memories. Storage devices **48** may store program instructions and/or data associated with UI interface module **16**, visual characteristic module **16**, and application modules **17**.

[0039] Storage devices **48** may also include operating system **54**. In some examples, operating system **54** may manage various processes and components of computing device **2**, such as storage devices, input, output, and peripheral devices. Operating system **54** may also generate events, e.g., based on timers, and/or interrupts, that applications of computing device **2** may receive, for example using an event handler.

[0040] Applications **17** may store a variety of data to storage devices **22**, such as contact data ("contacts **22**"). Contacts **22** may, for example, comprise a database or other data structure that an application, such as a phone dialer application, a notifications application, or a messaging application may access. Although illustrated as being stored locally on storage devices **48**, some contacts of contacts **22** may also be stored remotely, for example in a cloud.

[0041] One or more processors **40** may implement functionality and/or execute instructions within computing device **2**. For example, processors **40** on computing device **2** may read and execute instructions stored by storage devices **48** that execute the functionality application of UI device module **6**, application feature module **8**, user interface elements **12**A and **12**B, visual characteristic module **16**, application modules **17**, and operating system **54**. These instructions executed by processors **40** may cause computing device **2** to store information within storage devices **48** during program execution, such as information related to the age of user interface elements, notification objects, and/or information associated with contacts **22**.

[0042] As described above with respect to FIG. **1**, computing device **2** may be configured to generate and output user interface elements having enhanced visual characteristics based on various factors. In some examples, the visual characteristics may modify at least one of a chrominance and a luminance value associated with the user interface elements. As a first example, storage devices **48** may include application feature module **8** operable to determine an age associated with each of a plurality of features of applications modules **17**. Application feature module **8** may include a database or other data that may store the age of each of the features of one of the applications of application modules **17** in storage devices **48**. Based on the age of each UI element, application feature module **8** may generate a visual characteristic that is associated with each UI element of the application of application modules **17**. In some examples, visual characteristic module **16** may modify the quality of the visual effect before UID **4** outputs the visual characteristic to presence-sensitive display **20**. As an example, visual characteristic module **16** may modify the chrominance, luminance, or other properties of the visual characteristic before UID **4** outputs the visual characteristic at presence-sensitive display **20**. After visual character module **16** modifies the quality of the visual characteristics, UID **4** outputs the visual characteristics associated with each UI element of the application of application modules **17**.

[0043] As a second example of generating enhanced visual characteristics, application feature module **8** may also be configured to determine a time since a user, such as user **102**

has interacted with a particular user interface element of an application, and based on that time, UID **4** may output different visual characteristics to presence-sensitive display **20**. In this example user **102** may select one or more UI elements. Based on the time that user **102** selects a first one of the UI elements of the application, application feature module **8** may store a date on storage devices **48**. Based on the date, application feature module **8** may determine an age for the first one of the UI elements of the application. Application feature module **8** may generate visual characteristics, which may modify at least one of a chrominance or luminance value of the first one of the user interface elements, based on the age, which visual characteristic module **16** may modify. After visual characteristic module **16** modifies the visual characteristics, UI device **4** outputs the visual characteristics for display at presence-sensitive display **20**. Based on the visual characteristics associated with each of the UI elements, user **102** of computing device **2** may be able to more easily identify application capabilities and UI elements that user **102** has interacted with more recently and less recently.

[0044] As described above, computing device **2** may output enhanced visual characteristics based on various factors in accordance with the techniques of this disclosure. The enhanced visual characteristics may enhance the experience of a user, such as user **102**, of computing device **2**, by drawing the attention of the user to the interface elements that are associated with the improved visual effects.

[0045] FIGS. **3**A-**3**B are conceptual diagrams that illustrate visual characteristics associated with user interface elements controlled by computing device **2** based on a period of time since a user has interacted with the user interface elements, in accordance with one or more aspects of the present disclosure. FIGS. **3**A and **3**B illustrate two GUIs, GUI **80**, and GUI **88**. GUIs **80** and **88** generally include the same user interface elements, i.e., user interface elements **81**, **82**, **83**, **84**, and **85**. Graphical elements **81**, **82**, and **84** of GUI **80**, and graphical elements **81**, and **82** of GUI **88**, that include diagonal, horizontal, and/or vertical hashing, may indicate UI elements to which visual characteristic module **16** (FIG. **2**) has applied one or more visual characteristics.

[0046] In some examples, the visual characteristics applied to UI elements **81**, **82**, and **84** may modify the chrominance or luminance values associated with UI elements **81**, **82**, and **84**. The visual characteristics may make UI elements appear to user **102** as though they have reflective properties, such as the reflective properties of a piece of metal or a shiny piece of plastic or another material. Visual characteristic module **16** may also adjust various properties of the visual characteristics based on various criteria.

[0047] As one example, visual characteristic module **16** may receive a brightness measurement of the environment of computing device **2** from a brightness sensor, which may be one of input devices **44** (FIG. **2**). The brightness measurement may indicate an amount of light detected by the brightness sensor. Based on the brightness measurement, visual characteristic module **16** may adjust the intensity of the visual characteristics for each of the user interface elements. As an example, if the detected brightness measurement increases, the intensity of the visual effect, e.g., the reflectivity or shininess may increase or decrease.

[0048] Computing device **2** may also adjust the visual characteristics for each of the UI elements of a GUI based on the movement of computing device **2**. As an example, an accelerometer, which may comprise one of input devices **44** may detect an indication (e.g., a movement) that computing device **2** has moved, and may generate an indication, such as a signal responsive to detecting the movement indication. Visual characteristic module **16** may receive the indication that computing device **2** has moved, and may update the visual characteristics for each of the UI elements **81**, **82**, **83**, **84**, and **85** based on the movement indication. As an example, visual characteristic module **16** may update a reflection characteristic, such as a lens flare effect generated by computing device as if a light source were present. That is, visual characteristic module **16** may dynamically update a graphical depiction of a lens flare due to movement of computing device **2** that would change the position of the computing device relative to the position of the imaginary light source.

[0049] Visual characteristic module **16** may update the visual characteristics for each of the UI elements **81**-**85** based on an image captured using a camera of computing device **2**. In this example, the camera may capture an image, which in some cases may comprise an image of a user of computing device **2**, such as user **102**. Visual characteristic module **16** receives the captured image and updates the visual characteristics for each of UI elements **81**-**85** such that the visual characteristics include at least a portion of the captured image.

[0050] In the example of FIG. **3**A, UID **4** outputs GUI **80** for display at presence-sensitive display **20** at time (t_1) **90**. In accordance with the techniques of this disclosure of generating enhanced visual characteristics based on various factors, application feature module **8** may determine a respective age for each of UI elements **81**, **82**, **83**, **84**, and **85**. As described with respect to FIGS. **1** and **2**, application feature module **8** may keep a record of the various UI elements of an application, such as any of the applications illustrated in FIGS. **1**, **3**, and **4**. Application feature module **8** may keep a record of the last time that a user, such as user **102** has selected each UI element, and may determine age for each UI element that is based on the amount of time that has elapsed since each of UI elements **81**, **82**, **83**, **84**, and **85** was last selected in the application. Based on the age of each of UI elements **81**-**85**, visual characteristic module **16** may generate a respective visual characteristic for each of UI elements **81**-**85**, and UID **4** may output the respective visual characteristics for each of the UI elements **81**-**85**.

[0051] At a later time (t_2) **92**, user **102** may interact with UI element **84** of GUI **88**. Based on the interaction with UI element **84**, application feature module **8** may update the time since UI element **84** was last selected (e.g., the age of the UI element). Application feature module **8** may cause visual characteristic module **16** to update the visual characteristic associated with UI element **84**. User interface device **4** may then output the updated visual characteristic for UI element **84**.

[0052] As examples of how visual effects module **16** generates the visual characteristics for UI elements **81**-**85** based on the age of UI elements **81**-**85**, UID **4** may no longer display a visual characteristic for UI element **84** based on the updated age of UI element **84** due user **102** selecting UI element **84** at time (t_1) **90**. Additionally, because time has elapsed between time **92** and time **90**, the age of UI elements **81** and **82** in FIG. **3**B may have increased. Accordingly, visual characteristic module **16** updates the visual characteristics, and user interface device **4** outputs the updated visual characteristics for UI elements **81** and **82**. The different hashings of FIGS. **3**A and

3B illustrated with UI elements **81-83** represent changed visual characteristics for UI elements **81** and **82**.

[0053] FIG. **4** is a conceptual diagram that illustrates generating and outputting enhanced visual characteristics associated with a user interface elements that represent one or more contacts, in accordance with one or more aspects of the present disclosure. FIG. **4** illustrates a GUI **400** of computing device **2** that may include user interface elements **402**, **404**, and **406**, each of which may represent one or more contacts associated with user **102** of computing device **2**. UI elements **402**, **404**, and **404** may each comprise a graphical representation of one or more of contacts **22**.

[0054] GUI **400** may represent, in the example of FIG. **4**, an application, such as a notifications application that may inform user **102** of various new events, such as communications that computing device **2** has received since user **102** last interacted with computing device **2**. The events may include missed or received phone calls, receipt of messages, such as text and voice messages, received e-mails, and notifications from applications, such as social networking applications.

[0055] A module of computing device **2**, such as one of application modules **17** may determine a classification of one or more of contacts **22** (e.g, a "preferred" status) based on various criteria, such as frequency of communication that user **102** has had with a particular contact, the time that has elapsed since user **102** has communicated with a particular contact, a number of messages or conversations with a particular contact, or other communication metrics or preferences of user **102**. For graphical elements **402**, **404**, **406** that represent a contact that one of application modules **17** has classified as a preferred contact for user **102**, visual characteristic module **16** may generate and user interface device **4** may output a visual characteristic indicative of the status of the contact.

[0056] One of application modules **17** may also determine that the contact represented by UI element **404** represents does not correspond to a preferred contact. Based on that determination, visual characteristic module **16** may generate, and user interface device **4** may output a second, different visual characteristic for UI element **404**. In this example, UI elements **404** and **406** may correspond to one or more of contacts **22** (FIG. **2**).

[0057] In some examples, visual characteristic module **16** may also generate the visual characteristic for the UI element associated with each contact based on the communication with the contact and information associated with the contact. For example, visual characteristic module **16** may generate different visual effects for a contact associated with a social network application, than for a contact in a phone application or a text messaging application. In another example, visual characteristic module **16** may generate different visual effects based on the frequency of communication with each contact.

[0058] Although GUI **400** is illustrated as a notification application, the techniques of this disclosure and with respect to FIG. **4** may apply to other applications, as well. Some example applications that may output visual characteristics based on the determination that a UI element is associated with a preferred contact may include a phone dialer application, text or voice messaging application, social networking application, or any other application that may include UI elements that correspond to contacts **22** of computing device **2**.

[0059] In general, visual characteristic module **16** may generate, and user interface device **4** may output any of the visual characteristics described in this disclosure for any of UI elements **402**, **404**, and **406** that may be associated with any of contacts **22**. Such visual characteristics may include shining, shimmering, highlight and/or glimmering effects, and visual characteristics that include at least a portion of an image captured by a camera of computing device **2**.

[0060] FIG. **5** is a block diagram illustrating an example computing device that outputs graphical content for display at a remote device, in accordance with one or more techniques of the present disclosure. Graphical content, generally, may include any visual information that may be output for display, such as text, images, a group of moving images, etc. The example shown in FIG. **5** includes a computing device **500**, presence-sensitive display **501**, communication unit **510**, projector **520**, projector screen **522**, tablet device **526**, and visual display device **130**. Although shown for purposes of example in FIGS. **1** and **2** as a stand-alone computing device **500**, a computing device may, generally, be any component or system that includes a processor or other suitable computing environment for executing software instructions and, for example, need not include a presence-sensitive display.

[0061] As shown in the example of FIG. **5**, computing device **500** may be a processor that includes functionality as described with respect to processor **40** in FIG. **2**. In such examples, computing device **500** may be operatively coupled to presence-sensitive display **501** by a communication channel **502**A, which may be a system bus or other suitable connection. Computing device **500** may also be operatively coupled to communication unit **510**, further described below, by a communication channel **502**B, which may also be a system bus or other suitable connection. Although shown separately as an example in FIG. **5**, computing device **500** may be operatively coupled to presence-sensitive display **501** and communication unit **510** by any number of one or more communication channels.

[0062] In other examples, such as illustrated previously in FIGS. **1-2**, computing device **500** may be a portable or mobile device such as mobile phones (including smart phones), laptop computers, etc. In some examples, computing device **500** may be a desktop computers, tablet computers, smart television platforms, cameras, personal digital assistants (PDAs), servers, mainframes, etc.

[0063] Presence-sensitive display **501**, as shown in FIG. **5**, may include display device **503** and presence-sensitive input device **505**. Display device **503** may, for example, receive data from computing device **500** and display the graphical content. In some examples, presence-sensitive input device **505** may determine one or more user inputs (e.g., continuous gestures, multi-touch gestures, single-touch gestures, etc.) at presence-sensitive display **501** using capacitive, inductive, and/or optical recognition techniques and send indications of such user input to computing device **500** using communication channel **502**A. In some examples, presence-sensitive input device **505** may be physically positioned on top of display device **503** such that, when a user positions an input unit over a graphical element displayed by display device **503**, the location at which presence-sensitive input device **505** corresponds to the location of display device **503** at which the graphical element is displayed.

[0064] As shown in FIG. **5**, computing device **500** may also include and/or be operatively coupled with communication unit **510**. Communication unit **510** may include functionality of communication unit **44** as described in FIG. **2**. Examples of communication unit **510** may include a network interface

card, an Ethernet card, an optical transceiver, a radio frequency transceiver, or any other type of device that can send and receive information. Other examples of such communication units may include Bluetooth, 3G, and WiFi radios, Universal Serial Bus (USB) interfaces, etc. Computing device **500** may also include and/or be operatively coupled with one or more other devices, e.g., input devices, output devices, memory, storage devices, etc. that are not shown in FIG. **3** for purposes of brevity and illustration.

[0065] FIG. **5** also illustrates a projector **520** and projector screen **522**. Other such examples of projection devices may include electronic whiteboards, holographic display devices, and any other suitable devices for displaying graphical content. Projector **520** and project screen **522** may include one or more communication units that enable the respective devices to communicate with computing device **500**. In some examples, the one or more communication units may enable communication between projector **520** and projector screen **522**. Projector **520** may receive data from computing device **500** that includes graphical content. Projector **520**, in response to receiving the data, may project the graphical content onto projector screen **522**. In some examples, projector **520** may determine one or more user inputs (e.g., continuous gestures, multi-touch gestures, single-touch gestures, etc.) at projector screen using optical recognition or other suitable techniques and send indications of such user input using one or more communication units to computing device **500**.

[0066] Projector screen **522**, in some examples, may include a presence-sensitive display **524**. Presence-sensitive display **524** may include a subset of functionality or all of the functionality of UI device **4** as described in this disclosure. In some examples, presence-sensitive display **524** may include additional functionality. Projector screen **522** (e.g., an electronic whiteboard), may receive data from computing device **500** and display the graphical content. In some examples, presence-sensitive display **524** may determine one or more user inputs (e.g., continuous gestures, multi-touch gestures, single-touch gestures, etc.) at projector screen **522** using capacitive, inductive, and/or optical recognition techniques and send indications of such user input using one or more communication units to computing device **500**.

[0067] FIG. **5** also illustrates tablet device **526** and visual display device **530**. Tablet device **526** and visual display device **530** may each include computing and connectivity capabilities. Examples of tablet device **526** may include e-reader devices, convertible notebook devices, hybrid slate devices, etc. Examples of visual display device **530** may include televisions, computer monitors, etc. As shown in FIG. **5**, tablet device **526** may include a presence-sensitive display **528**. Visual display device **530** may include a presence-sensitive display **532**. Presence-sensitive displays **528**, **532** may include a subset of functionality or all of the functionality of UI device **4** as described in this disclosure. In some examples, presence-sensitive displays **528**, **532** may include additional functionality. In any case, presence-sensitive display **532**, for example, may receive data from computing device **500** and display the graphical content. In some examples, presence-sensitive display **532** may determine one or more user inputs (e.g., continuous gestures, multi-touch gestures, single-touch gestures, etc.) at projector screen using capacitive, inductive, and/or optical recognition techniques and send indications of such user input using one or more communication units to computing device **500**.

[0068] As described above, in some examples, computing device **500** may output graphical content for display at presence-sensitive display **501** that is coupled to computing device **500** by a system bus or other suitable communication channel. Computing device **500** may also output graphical content for display at one or more remote devices, such as projector **520**, projector screen **522**, tablet device **526**, and visual display device **530**. For instance, computing device **500** may execute one or more instructions to generate and/or modify graphical content in accordance with techniques of the present disclosure. Computing device **500** may output the data that includes the graphical content to a communication unit of computing device **500**, such as communication unit **510**. Communication unit **510** may send the data to one or more of the remote devices, such as projector **520**, projector screen **522**, tablet device **526**, and/or visual display device **530**. In this way, computing device **500** may output the graphical content for display at one or more of the remote devices. In some examples, one or more of the remote devices may output the graphical content at a presence-sensitive display that is included in and/or operatively coupled to the respective remote devices.

[0069] In some examples, computing device **500** may not output graphical content at presence-sensitive display **501** that is operatively coupled to computing device **500**. In other examples, computing device **500** may output graphical content for display at both a presence-sensitive display **501** that is coupled to computing device **500** by communication channel **502**A, and at one or more remote devices. In such examples, the graphical content may be displayed substantially contemporaneously at each respective device. For instance, some delay may be introduced by the communication latency to send the data that includes the graphical content to the remote device. In some examples, graphical content generated by computing device **500** and output for display at presence-sensitive display **501** may be different than graphical content display output for display at one or more remote devices.

[0070] Computing device **500** may send and receive data using any suitable communication techniques. For example, computing device **500** may be operatively coupled to external network **514** using network link **512**A. Each of the remote devices illustrated in FIG. **5** may be operatively coupled to network external network **514** by one of respective network links **512**B, **512**C, and **512**D. External network **514** may include network hubs, network switches, network routers, etc., that are operatively inter-coupled thereby providing for the exchange of information between computing device **500** and the remote devices illustrated in FIG. **5**. In some examples, network links **512**A-**512**D may be Ethernet, ATM or other network connections. Such connections may be wireless and/or wired connections.

[0071] In some examples, computing device **500** may be operatively coupled to one or more of the remote devices included in FIG. **5** using direct device communication **518**. Direct device communication **518** may include communications through which computing device **500** sends and receives data directly with a remote device, using wired or wireless communication. That is, in some examples of direct device communication **518**, data sent by computing device **500** may not be forwarded by one or more additional devices before being received at the remote device, and vice-versa. Examples of direct device communication **518** may include Bluetooth, Near-Field Communication, Universal Serial Bus, WiFi, infrared, etc. One or more of the remote devices illus-

trated in FIG. **5** may be operatively coupled with computing device **500** by communication links **516**A-**516**D. In some examples, communication links **512**A-**512**D may be connections using Bluetooth, Near-Field Communication, Universal Serial Bus, infrared, etc. Such connections may be wireless and/or wired connections.

[0072] In accordance with techniques of the disclosure, computing device **500** may be operatively coupled to visual display device **530** using external network **514**. Computing device **500** may output for display at visual display device **530** a graphical user interface of an application including a plurality of elements, each respective element of the plurality of elements being associated with one of a plurality of application capabilities. Presence-sensitive input device **505** may determine a respective age of each one of the plurality of application capabilities, each respective age being a period of time that has elapsed since that application capability was added to the application. Computing device **500** may generate, based on the respective age of each one of the plurality of application capabilities associated with each of the plurality of elements and by the computing device, a respective visual characteristic for each of the plurality of elements. In some examples, the enhanced visual characteristics may modify at least one of a chrominance and a luminance value associated with the plurality of elements. Presence-sensitive input device **505** may output and for display at the display device, the respective visual characteristic for each one of the plurality of application capabilities associated with each of the plurality of elements in accordance with the techniques of this disclosure.

[0073] FIG. **6** is a flow diagram illustrating an example operation of the computing device, in accordance with one or more aspects of the present disclosure. The operations of FIG. **6** may be performed by one or more processors of a computing device, processors **40** of computing device **2** illustrated in FIG. **1** and FIG. **2**. For purposes of illustration, FIG. **5** is described below within the context of computing devices **2** of FIG. **1** and FIG. **2** or computing device **500** of FIG. **5**.

[0074] Computing device **2** may output for display, a graphical user interface of an application, the graphical user interface including a plurality of elements, each respective element of the plurality of elements being associated with one of a plurality of application features (**600**). User interface device **4** may determine an age for a first application feature of the plurality of application features, the age being a period of time that has elapsed since that application feature was enabled in the application (**601**). Visual characteristic module **16** may generate, based on the age, a visual characteristic that modifies at least one of a chrominance or luminance value associated with the first application feature (**602**). UID **4** may output and for display at the display device, the visual characteristic (**603**).

[0075] In some examples, a camera coupled to the computing device may capture an image, and each the visual effect may include at least a portion of the image. In some examples, the image may comprise an image of a user associated with the computing device.

[0076] The operations of the method illustrated in FIG. **6** may further include capturing, by a light sensor of computing device computing device **2**, a brightness measurement of an environment of the computing device, and adjusting, based on the brightness measurement of the environment, an intensity of the visual characteristic.

[0077] In some examples, an accelerometer of computing device **2** may detect an indication that the computing device has moved. Computing device **2** may receive the indication that the computing device has moved, and responsive to receiving the indication that the computing device has moved, may update the visual characteristic based on the movement indication. UID **4** may output the updated visual characteristic. In some examples, the visual characteristic comprises one of a glimmer, shimmer, highlight, and shine.

[0078] In another example, generating the visual characteristic may comprise generating an intensity for the visual characteristic from the plurality of elements, and the intensity of each visual characteristic may decrease as the age of the application capability associated with that element increases.

[0079] FIG. **7** is a flow diagram illustrating an example operation of the computing device, in accordance with one or more aspects of the present disclosure. The operations of FIG. **7** may be performed by one or more processors of a computing device, processors **40** of computing device **2** illustrated in FIG. **1** and FIG. **2** or computing device **500** of FIG. **5**. For purposes of illustration, FIG. **7** is described below within the context of computing devices **2** of FIG. **1** and FIG. **2**.

[0080] Computing device **2** may output for display, a graphical user interface of an application, the graphical user interface including a plurality of elements (**700**). Application feature module **8** of computing device **2** may determine an age for a first element of the plurality of elements, the age being a period of time that has elapsed since the first element was last selected in the application (**701**). Visual characteristic module **16** may generate, based on the respective age of the first element, a visual characteristic that modifies at least one of a chrominance or luminance value that indicates the age of the first element (**702**), and computing device **2** may output for display, the visual characteristic for the first element (**703**).

[0081] In some examples, a camera coupled to the computing device may capture an image, and the visual effect may include at least a portion of the image. In some examples, the image may comprise an image of a user associated with the computing device.

[0082] The operations of the method illustrated in FIG. **7** may further include capturing, by a light sensor of computing device computing device **2**, a brightness measurement of an environment of the computing device, and adjusting, based on the brightness measurement of the environment, an intensity of the respective visual characteristic.

[0083] In some examples, an accelerometer of computing device **2** may detect an indication that the computing device has moved. Computing device **2** may receive the indication that the computing device has moved, and responsive to receiving the indication that the computing device has moved, may update each respective visual characteristic based on the movement indication. UID **4** may output the updated visual characteristic for display at presence-sensitive display **20**. In some examples, each respective visual characteristic comprises one of a glimmer, shimmer, highlight, and shine.

[0084] In an example, computing device **2** may generate an intensity for the visual characteristic. The intensity of the respective visual characteristic may decrease as the period of time that has elapsed since that element was last selected increases.

[0085] FIG. **8** is a flow diagram illustrating an example operation of the computing device, in accordance with one or more aspects of the present disclosure. The operations of FIG.

8 may also be performed by one or more processors of a computing device, processors **40** of computing device **2** illustrated in FIG. **1** and FIG. **2**. For purposes of illustration, FIG. **7** is described below within the context of computing devices **2** of FIG. **1** and FIG. **2** and/or computing device **500** of FIG. **5**.

[0086] Computing device **2** may receive a communication associated with a contact (**800**). Computing device **2** may also determine whether the contact is classified as a preferred contact based on a variety of factors, as described above (**801**). Responsive to determining that the contact is classified as a preferred contact, visual characteristic module **16** may generate based on the communication and information associated with the contact, a graphical element having a first visual characteristic, the first visual characteristic being one of a glimmer, shimmer, highlight, and shine (**803**). Responsive to determining that the contact is not classified as a preferred contact, visual characteristic module **16** may generate, based on the communication and information associated with the contact, a graphical element having a second visual characteristic, the second visual characteristic being different from the first visual characteristic (**802**). Computing device **2** may output for display at presence-sensitive display **20**, a graphical user interface including the graphical element.

[0087] In some examples, a camera coupled to the computing device may capture an image, and each respective visual effect may include at least a portion of the image. In some examples, the image may comprise an image of a user associated with the computing device.

[0088] The operations of the method illustrated in FIG. **8** may further include capturing, by a light sensor of computing device computing device **2**, a brightness measurement of an environment of the computing device, and adjusting, based on the brightness measurement of the environment, an intensity of each respective visual characteristic.

[0089] In some examples, an accelerometer of computing device **2** may detect an indication that the computing device has moved. Computing device **2** may receive the indication that the computing device has moved, and responsive to receiving the indication that the computing device has moved, may update each respective visual characteristic based on the movement indication for output by UID **4**.

[0090] In one or more examples, the functions described herein may be implemented in hardware, software, firmware, or any combination thereof. If implemented in software, the functions may be stored on or transmitted over, as one or more instructions or code, a computer-readable medium and executed by a hardware-based processing unit. Computer-readable media may include computer-readable storage media, which corresponds to a tangible medium such as data storage media, or communication media including any medium that facilitates transfer of a computer program from one place to another, e.g., according to a communication protocol. In this manner, computer-readable media generally may correspond to (1) tangible computer-readable storage media, which is non-transitory or (2) a communication medium such as a signal or carrier wave. Data storage media may be any available media that can be accessed by one or more computers or one or more processors to retrieve instructions, code and/or data structures for implementation of the techniques described in this disclosure. A computer program product may include a computer-readable medium.

[0091] By way of example, and not limitation, such computer-readable storage media can comprise RAM, ROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage, or other magnetic storage devices, flash memory, or any other medium that can be used to store desired program code in the form of instructions or data structures and that can be accessed by a computer. Also, any connection is properly termed a computer-readable medium. For example, if instructions are transmitted from a website, server, or other remote source using a coaxial cable, fiber optic cable, twisted pair, digital subscriber line (DSL), or wireless technologies such as infrared, radio, and microwave, then the coaxial cable, fiber optic cable, twisted pair, DSL, or wireless technologies such as infrared, radio, and microwave are included in the definition of medium. It should be understood, however, that computer-readable storage media and data storage media do not include connections, carrier waves, signals, or other transient media, but are instead directed to non-transient, tangible storage media. Disk and disc, as used herein, includes compact disc (CD), laser disc, optical disc, digital versatile disc (DVD), floppy disk and Blu-ray disc, where disks usually reproduce data magnetically, while discs reproduce data optically with lasers. Combinations of the above should also be included within the scope of computer-readable media.

[0092] Instructions may be executed by one or more processors, such as one or more digital signal processors (DSPs), general purpose microprocessors, application specific integrated circuits (ASICs), field programmable logic arrays (FPGAs), or other equivalent integrated or discrete logic circuitry. Accordingly, the term "processor," as used herein may refer to any of the foregoing structure or any other structure suitable for implementation of the techniques described herein. In addition, in some aspects, the functionality described herein may be provided within dedicated hardware and/or software modules. Also, the techniques could be fully implemented in one or more circuits or logic elements.

[0093] The techniques of this disclosure may be implemented in a wide variety of devices or apparatuses, including a wireless handset, an integrated circuit (IC) or a set of ICs (e.g., a chip set). Various components, modules, or units are described in this disclosure to emphasize functional aspects of devices configured to perform the disclosed techniques, but do not necessarily require realization by different hardware units. Rather, as described above, various units may be combined in a hardware unit or provided by a collection of interoperative hardware units, including one or more processors as described above, in conjunction with suitable software and/or firmware.

[0094] Various examples have been described. These and other examples are within the scope of the following claims.

What is claimed is:

1. A method comprising:

outputting, by a computing device and for display, a graphical user interface of an application, the graphical user interface including a plurality of elements, each respective element of the plurality of elements being associated with a respective feature of a plurality of features of the application;

determining, by the computing device, an age for a first feature of the plurality of features, the age being a period of time that has elapsed since the first feature was enabled in the application;

generating, by the computing device, based on the age, a visual characteristic that modifies a visual appearance of

the respective element of the plurality of elements associated with the first feature; and

outputting, by the computing device and for display, the visual characteristic in the graphical user interface.

2. The method of claim **1**, wherein the visual characteristic includes at least a portion of an image.

3. The method of claim **2**, wherein the image represents a user associated with the computing device.

4. The method of claim **1**, further comprising:

capturing, by a light sensor of the computing device, a brightness measurement of an environment of the computing device; and

adjusting, by the computing device and based on the brightness measurement of the environment, an aspect of the visual characteristic.

5. The method of claim **1**, further comprising:

receiving, by the computing device, an indication that the computing device has moved;

responsive to receiving the indication that the computing device has moved, updating the visual characteristic; and

outputting the updated visual characteristic.

6. The method of claim **1**, wherein generating the visual characteristic comprises:

determining an intensity for the visual characteristic, the intensity of the visual characteristic decreasing as the age of the feature associated with the element increases.

7. A method comprising:

outputting, by a computing device for display, a graphical user interface of an application, the graphical user interface including a plurality of elements;

determining, by the computing device, an age for a first element of the plurality of elements, the age being a period of time that has elapsed since the first element was last selected in the application;

generating, by the computing device, based on the age of the first element, a visual characteristic that indicates the age of the first element; and

outputting, by the computing device for display, the visual characteristic for the first element.

8. The method of claim **7**, further comprising:

generating, by the computing device, an updated visual characteristic including at least a portion of an image.

9. The method of claim **8**, wherein the image comprises an image of a user of the computing device.

10. The method of claim **7**, further comprising:

capturing, by a light sensor of the computing device, a brightness measurement of an environment of the computing device; and

adjusting an aspect of the visual characteristic based on the brightness measurement of the environment of the computing device.

11. The method of claim **7**, further comprising:

receiving, by the computing device, an indication that the computing device has moved; and

responsive to receiving the indication, updating the visual characteristic.

12. The method of claim **7**, further comprising:

determining an intensity for the visual characteristic, wherein the visual characteristic decreases as the period of time that has elapsed since the first element was last selected increases.

13. A device comprising:

at least one processor;

at least one module operable by the at least one processor to:

output, for display, a graphical user interface of an application, the graphical user interface including a plurality of elements, each respective element of the plurality of elements being associated with one of a plurality of features;

determine an age for a first feature of the plurality of application features, the age being a period of time that has elapsed since the first feature was enabled in the application;

generate, based on the age, a visual characteristic that modifies a visual appearance of the respective element of the plurality of elements associated with the first feature; and

output, for display, the visual characteristic in the graphical user interface.

14. The device of claim **13**, wherein each respective visual characteristic includes at least a portion of an image.

15. The device of claim **14**, wherein the image comprises an image of a user associated with the computing device.

16. The device of claim **13**, further comprising:

a light sensor to capture a brightness measurement of an environment of the computing device,

wherein the at least one module is further operable by the at least one processor to adjust, based on the brightness measurement of the environment, an aspect of the visual characteristic.

17. The device of claim **13**, further comprising:

an accelerometer to detect an indication that the computing device has moved,

wherein the at least one module is further operable by the at least one processor to:

receive the indication that the computing device has moved;

responsive to receiving the indication that the computing device has moved, update the visual characteristic; and

output the updated visual characteristic.

18. The device of claim **13**, wherein the at least one module is further operable by the at least one processor to determine an intensity for the visual characteristic from the plurality of elements, the intensity of each visual characteristic decreasing as the age of the feature associated with the element increases.

19. A device comprising:

at least one processor;

at least one operable by the at least one processor to:

output, for display at a display device, a graphical user interface of an application, the graphical user interface including a plurality of elements;

determine an age for a first element of the plurality of elements, the age being a period of time that has elapsed since the first element was last selected in the application;

generate, based on the age, a visual characteristic that indicates the age of the first element; and

output, for display, the visual characteristic for the first element in the graphical user interface.

20. The device of claim **19**, further comprising:

an accelerometer that detects movement of the computing device,

wherein the user interface module is further operable by the at least one processor to:

receive an indication that the computing device has moved; and

responsive to receiving the indication, update the visual characteristic.

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