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Display device and display method

Abstract

In a display device **100**, a photographing unit **12** is configured to photograph the surroundings of the display device **100**, and the recognizing unit **16** is configured to recognize a clock **300** (a real object regarding a time or date) from a result of the photographing. When the recognizing unit **16** recognizes the clock **300**, the schedule obtaining unit **11** is configured to obtain schedule information, and the display controller **17** is configured to display and output the schedule information in accordance with a position of the clock **300**. In this case, since the display device **100** displays the schedule information in accordance with the position of the clock **300**, the schedule information can be displayed in association with actual environment, and the schedule information can be outputted in a format that is easier to recognize the schedule information.

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Background/Summary

TECHNICAL FIELD
(1) The present invention relates to a display device and a display method.

BACKGROUND ART

(2) Conventionally, there have been head mounted displays using augmented reality, and there is a technique for displaying schedule information by using the head mounted display (for example, Patent Document 1).

RELATED ART DOCUMENTS

Patent Documents

(3) Patent Document 1: Japanese Patent Application Laid-Open Publication No. 2017-120556

SUMMARY OF THE INVENTION

Problems to be Solved by the Invention

(4) In a technique disclosed in Patent Document 1 described above, when a user who wears a head mounted display looks at a clock, the head mounted display displays schedule information accordingly. It is desirable that such schedule information is displayed in association with actual environment. Namely, displaying it in fusion with an actual object can provide more useful information for the user.

(5) It is an object of the present invention to display schedule information in association with actual environment.

(6) The foregoing and other objects, and new features of the present invention will become more apparent from the detailed description of the present specification and the appending drawings.

Means for Solving the Problem

(7) Techniques described in the claims are used as means for solving the problem.

(8) As one example, a display device for displaying schedule information, which allows a user to be worn, includes: a schedule obtaining unit configured to obtain schedule information; a photographing unit configured to photograph surroundings of the display device; a recognizing unit configured to recognize a real object regarding a time or date from a result photographed by the photographing unit; and a display controller configured to display and output the schedule information obtained by the schedule obtaining unit in accordance with a position of the real object regarding the time or date in a case where the recognizing unit recognizes the real object regarding the time or date.

Effects of the Invention

(9) By using the technique of the present invention, it is possible to display schedule information in association with actual environment.

Description

BRIEF DESCRIPTIONS OF THE DRAWINGS

(1) FIG. **1** is a diagram for explaining a hardware configuration of a display device according to the present embodiment;

(2) FIG. **2** is a functional block diagram of the display device according to the present embodiment;

(3) FIG. **3** is a diagram for explaining a case where a user who wears the display device refers to a clock as a real object;

(4) FIG. **4** is a diagram for explaining a display example of schedule information;

(5) FIG. **5** is a flowchart for explaining a processing procedure for displaying the schedule information in accordance with a position of the clock;

(6) FIG. **6** is a diagram illustrating a display example including a clock displayed as AR; and

(7) FIGS. **7**(*a*) and **7**(*b*) are diagrams illustrating a display example of a digital wristwatch.

DETAILED DESCRIPTION OF EMBODIMENTS

(8) Hereinafter, an example of an embodiment of the present invention will be described with reference to the drawings.

(9) First, a hardware configuration of a display device **100** will be described with reference to FIG.

1. FIG. **1** is a diagram for explaining a hardware configuration of the display device **100**. This display device **100** is a device that a user can wear, and specifically, it is a head mounted display device. This head mounted display is a device that displays and executes various kinds of applications (for example, an application configured to output schedule information) so that the user can visually recognize them in a state where the user wears the head mounted display on his or her head. Note that the display device **100** may be a glasses-type head mounted display.

(10) The display device **100** has a main controller **101** to control respective units via a bus **102**. This main controller **101** is a CPU (Central Processing Unit) or the like. Further, the display device **100** includes a RAM **103**, a storage **110**, an operation input unit **120**, an image processor **130**, a sensor unit **150**, a communication processor **160**, and an extension I/F unit **170**.

(11) The operation input unit **120** includes operation keys **121**, a touch sensor **122**, and a touch panel **123**. The image processor **130** includes a display unit **131**, an image signal processor **132**, a first image input unit **133**, and a second image input unit **134**.

(12) The main controller **101** is an arithmetic processing apparatus that execute various kinds of information processing programs stored in the storage **110** to execute various kinds of functions. The RAM **103** becomes a work area at the time of execution of the various kinds of programs. The storage **110** is a part configured to store images taken by the first image input unit **133** or the second image input unit **134** based on a control of the main controller **101**, and various kinds of information. The storage **110** is a non-volatile storage medium such as a Flash ROM or an EEPROM.

(13) The operation input unit **120** is a user operation I/F configured to receive an operational input. The operation keys **121** are physical keys installed at a predetermined position of the display device **100** (for example, a power key, a volume key, a home key, and the like). The touch sensor **122** is an input sensor installed in a housing or the like of the display device **100**. The touch panel **123** is included in the display device **100**.

(14) The image processor **130** is realized by an image (video) processor or the like. In a case where the display unit **131** is a see-through type (or a transmission type) of display device, the display unit **131** is configured to superimpose and display an object on an actual image in a transparent type manner. Further, in a case where the display unit **131** is a non-transparent display device, the display unit **131** is configured to superimpose and display an object on a camera-through image in a non-transparent type manner

(15) The image signal processor **132** is an image signal processor, and is a part configured to analyze an image by the first image input unit **133** or the second image input unit **134** and output an analysis result to the main controller **101** or the like.

(16) The first image input unit **133** is a part configured to take an image of the outside. The second image input unit **134** is a part configured to take an image of eyes of the user.

(17) The sensor unit **150** is a part configured to obtain information for specifying a position and a direction of the display device **100**. The sensor unit **150** includes a GPS receiver **151**, a gyro sensor **152**, a geomagnetic sensor **153**, an acceleration sensor **154**, and a depth sensor **155**.

(18) The GPS receiver **151** receives a GPS signal to obtain GPS information. The gyro sensor **152** has a function to detect a moving direction of the display device **100**, and obtains gyro information indicating angular velocity data accompanying a change in the direction of the display device **100**. The geomagnetic sensor **153** is one type of an orientation detector configured to detect an angle indicating absolute orientation of the display device **100** on the basis of earth magnetism. As such an angle, for example, an azimuth angle can be cited. The acceleration sensor **154** has a function to detect at least one of an acceleration or an inclined angle of the display device **100**. The sensor unit **150** may further include a proximity sensor, an illuminance sensor, and the like. The depth sensor **155** is a so-called 3D sensor, which is a sensor that can capture a shape of an object such as a person or an object as a three-dimensional object by using distance information measured in a plane shape.

(19) The communication processor **160** is a communication processor configured to control wireless communication. The communication processor **160** is configured to transmit and receive information to and from an external device via a LAN or the like. The extension I/F unit **170** is an interface for connecting to peripheral devices.

(20) Subsequently, functions of the display device **100** will be described with reference to FIG. **2**. FIG. **2** is a functional block diagram of the display device **100**. The display device **100** includes a schedule obtaining unit **11**, a photographing unit **12**, a positional information obtaining unit **13**, a movement state determining unit **14**, a line-of-sight detector **15**, a recognizing unit **16**, and a display controller **17**. Note that these functions are realized by executing the various kinds of programs stored in the storage **110**. Further, the display device **100** has functions other than the functions illustrated in FIG. **2**.

(21) The schedule obtaining unit **11** is a part configured to obtain schedule information. The schedule obtaining unit **11** obtains the schedule information stored in the storage **110** in advance at predetermined timing, for example. As the timing, there is a case where the recognizing unit **16** (will be described later) recognizes a real object such as a clock.

(22) Here, the schedule information at least contains schedule content (for example, information regarding business trips, reservations, and the like) and information regarding a time when the schedule is to be executed (a start time of a schedule, an end time of the schedule, and the like). Further, a category may be associated with the schedule information. Here, the category indicates a place (for example, a house, a conference room, and the like) where the schedule information is displayed.

(23) The schedule obtaining unit **11** may be configured to obtain schedule information after a current time based on an internal clock of the display device **100**.

(24) The photographing unit **12** is a part configured to photograph the surroundings of the display device **100**. The photographing unit **12** starts photographing at predetermined timing. The photographing unit **12** is realized by the first image input unit **133** or the like, for example. The photographing unit **12** photographs the surroundings of the display device **100** at predetermined timing, and sends a photographed result (hereinafter, referred to as a "photographed result") to the recognizing unit **16**.

(25) The positional information obtaining unit **13** is a part configured to obtain positional information, which is information regarding a position of the display device **100**. The positional information obtaining unit **13** is realized by the GPS receiver **151** or the like, for example. The positional information obtaining unit **13** sends a signal thus obtained to the movement state determining unit **14** and the display controller **17**.

(26) The movement state determining unit **14** is a part configured to determine whether the user is moving or not on the basis of a change in the positional information obtained by the positional information obtaining unit **13**. The movement state determining unit **14** is realized by the main controller **101** or the like, for example. The movement state determining unit **14** obtains the positional information from the positional information obtaining unit **13**, and determines that the user is moving in a case where the change in the obtained positional information exceeds a standard defined in advance. Further, the movement state determining unit **14** may be configured to determine that the user is moving in a case where there is a change in facility specified by a known technique, such as matching with facility positional information contained in map information held in advance, on the basis of the positional information by the positional information obtaining unit **13**.

(27) The movement state determining unit **14** may determine whether the user is moving or not by a known technique such as autonomous navigation positioning based on not only the positional information but also other information (for example, a result by another sensor of the sensor unit **150**).

(28) The line-of-sight detector **15** is a part configured to detect a line of sight of the user. The line-

of-sight detector **15** is realized by the second image input unit **134** and the image signal processor **132**, or the like, for example. Specifically, the image signal processor **132** specifies a destination of the line of sight of the user on the basis of a state of the eyes of the user photographed by the second image input unit **134** by a known technique such as eye tracking using corneal reflex. The line-of-sight detector **15** sends information indicating the specified destination of the line of sight of the user to the display controller **17**.

(29) The recognizing unit **16** is a part configured to recognize a real object regarding a time or date from the result photographed by the photographing unit **12**. The recognizing unit **16** is realized by the main controller **101**, for example. When the recognizing unit **16** obtains the photographed result from the photographing unit **12**, the recognizing unit **16** analyzes an image of the photographed result, and determines whether the real object regarding the time or date is included in the photographed result or not by a known technique of image recognition.

(30) Here, the real object regarding the time or date is a clock in a room, a wristwatch worn by the user, a calendar in the room, or the like.

(31) In a case where the real object regarding the time or date is included in the photographed result, the recognizing unit **16** also specifies a position of the real object on the basis of the photographed result. Further, in a case where the real object is a clock, the recognizing unit **16** also recognizes a time indicated by the clock by the known technique of the image recognition. Further, similarly, the recognizing unit **16** also recognizes the position of the real object (for example, a relative position with respect to the front of the user) on the basis of the photographed result by the known technique of the image recognition.

(32) In a case where the real object is included, the recognizing unit **16** notifies the display controller **17** of the position and the time (if the real object is a clock) of the real object.

(33) In a case where the recognizing unit **16** recognizes the real object regarding the time or date, the display controller **17** is configured to display and output the schedule information obtained by the schedule obtaining unit **11** in accordance with the position of the real object regarding the time or date. The display controller **17** is realized by the main controller **101**, for example.

(34) The display controller **17** obtains the position and the time of the real object from the recognizing unit **16**, and obtains the schedule information from the schedule obtaining unit **11**. The display controller **17** displays and outputs the schedule information in accordance with the position of the real object recognized by the recognizing unit **16**. Here, an example of display control will be described with reference to FIG. **3** and FIG. **4**.

(35) FIG. **3** is a diagram for explaining a case where a user **500** who wears the display device **100** refers to a clock **300** as a real object. As illustrated in FIG. **3**, when the user **500** who wears the display device **100** looks at the clock **300**, the clock **300** enters a photographing range. Therefore, the recognizing unit **16** recognizes the clock **300**. Further, the recognizing unit **16** also recognizes a time indicated by the clock **300**.

(36) Note that when the recognizing unit **16** recognizes the clock **300**, the display controller **17** obtains schedule information from the schedule obtaining unit **11**. The display controller **17** displays the schedule information obtained by the schedule obtaining unit **11** in accordance with a position of the clock **300** recognized by the recognizing unit **16**.

(37) FIG. **4** is a diagram for explaining a display example of the schedule information. As illustrated in FIG. **4**, the display controller **17** displays and outputs the content **401***a* of schedule information and the content **401***b* of schedule information in accordance with the position of the clock **300**.

(38) In case of the example illustrated in FIG. **4**, it indicates that there is a schedule of a conference around 16 o'clock, and indicates that there is a schedule of a meeting around 17 o'clock.

(39) Note that the display controller **17** may be configured to compare a time managed by the display device **100** (a so-called internal clock) with a time recognized by the recognizing unit **16**, and output information indicating that effect in a case where there is a difference as a result of the

comparison. For example, in a case where the display controller **17** compares the time recognized by the recognizing unit **16** with the time managed by the display device **100** and the result is different by a permissible error time defined in advance (for example, 10 minutes) or longer, the display controller **17** displays and outputs information indicating that they are different from each other. Further, the display controller **17** may indicate how much the different is (for example, a delay of 15 minutes, or the like) as the information indicating that they are different from each other.

(40) As described above, by comparing the time managed by the display device **100** with the time recognized by the recognizing unit **16** and displaying that effect in a case where they are different from each other, it is possible to alert the user to that effect. This makes it possible to avoid the display device **100** from displaying the schedule information in accordance with a local clock having a time difference, a clock that has not been adjusted, or the like to cause an inconvenient situation for the user (such as being late).

(41) Further, the display controller **17** may display and output the schedule information of the category information corresponding to the positional information obtained by the positional information obtaining unit **13**.

(42) For example, the display controller **17** determines which facility the user is in on the basis of the positional information obtained by the positional information obtaining unit **13** by using a known technique such as matching by a database using map information or the like held in advance. the display controller **17** extracts schedule information associated with a category corresponding to the facility, and displays the extracted schedule information.

(43) For example, in a case where the display controller **17** determines that the user is at home on the basis of the positional information obtained by the positional information obtaining unit **13**, the display controller **17** displays schedule information of a private category. Further, in a case where the display controller **17** determines that the user is in a conference room of a company or the like, the display controller **17** displays schedule information indicating a schedule of use of the conference room when the recognizing unit **16** recognizes a clock in the conference room. By changing the schedule to be displayed depending upon the position where the user is present in this manner, it is possible to narrow down the display of the schedule desired by the user.

(44) Further, in a case where the line of sight detected by the line-of-sight detector **15** corresponds to the position of the real object recognized by the recognizing unit **16**, the display controller **17** may display and output the schedule information in accordance with the position of the real object recognized by the recognizing unit **16**. A method of determining whether the line of sight detected by the line-of-sight detector **15** corresponds to the position of the real object recognized by the recognizing unit **16** or not can be realized by the known technique such as the eye tracking using corneal reflex, for example.

(45) As described above, the display device **100** can display the schedule information at appropriate timing by displaying and outputting the schedule information on condition that it is detected that the line of sight of the user is aligned with the real object.

(46) Further, the display controller **17** may extract schedule information after the time indicated by the real object recognized by the recognizing unit **16**, display and output it. As a result, the display device **100** can narrow down the schedule information necessary for the user, display and output it.

(47) Subsequently, a processing procedure for displaying schedule information in accordance with a position of a clock will be described with reference to FIG. **5**. FIG. **5** is a flowchart for explaining the processing procedure for displaying the schedule information in accordance with the position of the clock.

(48) First, the photographing unit **12** of the display device **100** photographs the surroundings of the display device **100** at predetermined timing (Step S**1**).

(49) The recognizing unit **16** executes image processing for a result photographed by the photographing unit **12**, and determines whether there is a clock or not (Step S**2**). In a case where

the recognizing unit **16** determines that there is no clock by the image processing described above (Step S**2**: No), the processing flow proceeds to Step S**1**.

(50) In a case where the recognizing unit **16** determines that there is a clock by image processing described above (Step S**2**: Yes), the schedule obtaining unit **11** obtains schedule information (Step S**3**). Then, the display controller **17** displays and outputs the schedule information in accordance with a position of the clock (Step S**4**).

(51) Although it has not been mentioned particularly in the embodiment described above, the schedule obtaining unit **11** may communicate with an external server apparatus to obtain the schedule information.

(52) Although it has not been mentioned particularly in the embodiment described above, the display controller **17** may display schedule information in a helical manner with respect to a Z axis direction (a depth direction) in a case where a schedule to be displayed is 12 hours or longer at the time of displaying the schedule information on the clock. Further, the display controller **17** may display schedule information for the next day by exceeding 24 hours. Further, the display controller **17** may narrow down schedule information into an AM portion or a PM portion thereof depending upon a time (for example, a current time indicated by the internal clock), and display the narrowed-down schedule information.

(53) Although it has not been mentioned particularly in the embodiment described above, the display controller **17** display schedule information on an X-Y plane in a spiral manner when the schedule information is displayed on the clock.

(54) Further, the example in which the clock is recognized as the real object has been described in the embodiment described above. However, a calendar may be recognized.

(55) Further, the example in which the schedule information is displayed in a circular shape in accordance with a shape of an analog clock has been described in the embodiment described above. However, a clock may be displayed as AR, and display the schedule information on the clock displayed as the AR.

(56) Here, a display example including a clock displayed as AR will be described with reference to FIG. **6**. FIG. **6** is a diagram illustrating a display example including a clock displayed as AR.

(57) As illustrated in FIG. **6**, the display controller **17** displays the content **401***a* of schedule information whose start time is a current time immediately below the position of the clock **300**, and displays an AR clock **402***a* that indicates an end time of the content **401***a* of the schedule information. Further, the display controller **17** also displays the content **401***b* of schedule information whose start time is a time of the AR clock **402***a* and an AR clock **402***b* that indicates an end time of the content **401***b* of the schedule information.

(58) Further, the example in which the display device **100** displays the schedule information around the analog clock has been described in the embodiment described above. However, the schedule information may be displayed around a digital wristwatch of the user. Here, an example in which schedule information is displayed around a digital wristwatch will be described with reference to FIGS. **7**(*a*) and **7**(*b*). FIGS. **7**(*a*) and **7**(*b*) are diagrams illustrating a display example of a digital wristwatch.

(59) FIG. **7**(*a*) is an example in which the display controller **17** displays the content **401***c* of a schedule and the content **401***d* of a schedule around a clock portion **310** of a wristwatch. FIG. **7**(*b*) is an example in which the display controller **17** displays the content **401***e* of a schedule and the content **401***f* of a schedule around the clock portion **310** of the wristwatch. Information on a start time is also contained each of the content **401***e* of the schedule and the content **401***f* of the schedule.

(60) The display controller **17** may display the schedule of a plurality of days superimposed in a depth direction around the clock portion **310** of the wristwatch. Further, the schedule to be displayed may be changed in accordance with an operating state of the wristwatch. For example, in a case where the wristwatch is pulled to hands of the user, the display controller **17** may

preferentially display the latest schedule information.

(61) Although it has not been mentioned particularly in the embodiment described above, the display controller **17** may change a display position of the schedule information being displayed in accordance with measured results of the gyro sensor **152**, the geomagnetic **153**, sensor and the acceleration sensor **154**. As a result, in the display device **100**, the display controller **17** can control the schedule information so that a positional relationship between the real object and the schedule information to be displayed does not change from the position of the line of sight of the user to follow this even though the user changes his or her posture, and display the schedule information.

(62) Note that in a case where the movement state determining unit **14** determines that the user is moving, the display controller **17** may be configured to transition to detailed schedule information as a schedule corresponding to a situation that the user is moving, display and output the detailed schedule information.

(63) For example, it is assumed that there are schedule information "business trip" in an upper concept and detailed schedule information of "business trip" in a lower concept. It is assumed that information on a route during moving of a business trip is contained as the detailed schedule information of the business trip. In a case where the movement state determining unit **14** determines that a user is in a company on the basis of positional information obtained by the positional information obtaining unit **13** and a real object such as a clock is recognized, the display controller **17** displays the schedule information of the "business trip" in accordance with a position of the clock. Further, in a case where the movement state determining unit **14** determines that the user leaves the company on the basis of the positional information obtained by the positional information obtaining unit **13** and the real object such as the clock is recognized, the display controller **17** displays the detailed schedule information of the business trip in accordance with the position of the clock.

(64) The display device **100** switches the schedule information to be displayed in accordance with a movement state of the user in this manner, whereby it is possible to display and output the schedule information according to the situation.

(65) In a case where the real object regarding to a date is a calendar, the display controller **17** may specify a date to be watched in the calendar, and display a detailed schedule of the date. Further, when the display controller **17** is displaying the schedule information on the calendar and it is detected that the user watches a month name for a certain period of time (a reference time defined in advance, for example, 5 seconds), and then the line of sight of the user moves sideways, the display controller **17** may display schedules of months before and after the month. The display controller **17** may display the schedules of months before and after the month at a side portion, an upper portion, or a lower portion of the calendar as a display destination.

(66) Further, when the display controller **17** is displaying the schedule information on the calendar and it is detected that the user watches a year for a certain period of time (a reference time defined in advance, for example, seconds), and then the line of sight of the user moves sideways, the display controller **17** may display schedules of the same months of years of before and after the year. The display controller **17** may display the schedules of the same months of the years before and after the years at a side portion, an upper portion, or a lower portion of the calendar as a display destination.

(67) As described above, in the display device **100**, the photographing unit **12** photographs the surroundings of the display device **100**, and the recognizing unit **16** recognizes the clock **300** (the real object regarding the time or date) from the result of the photographing. When the recognizing unit **16** recognizes the clock **300**, the schedule obtaining unit **11** obtains the schedule information, and the display controller **17** displays and outputs the schedule information in accordance with the position of the clock **300**.

(68) In this case, the display device **100** displays the schedule information in accordance with the position of the clock **300**. Therefore, it is possible to display the schedule information in

association with actual environment, and it is possible to output the schedule information in a format that is easier to recognize.

(69) Further, the display controller **17** compares the time of the clock **300** recognized by the recognizing unit **16** with the internal clock. In a case where the difference is significant, the display controller **17** outputs the information indicating that effect. In this case, the display device **100** can call user's attention to a gap between the displayed schedule information and the time of the clock **300**.

(70) A part or all of the functions and the like described above of the present invention may be realized by hardware that is designed by an integrated circuit, for example. Further, the functions and the like may also be realized by software so that a microprocessor unit or the like interprets operation programs realizing the respective functions and executes the interpreted operation programs. Hardware and software may be used together.

(71) Further, control lines and information lines illustrated in figures are illustrated so long as they are thought to be necessary for explanation. All of the control lines and the information line are not necessarily illustrated on a product. In fact, it may be considered that almost all of the components are connected to each other.

REFERENCE SIGNS LIST

(72) **11** . . . schedule obtaining unit, **12** . . . photographing unit, **13** . . . positional information obtaining unit, **14** . . . movement

Claims

1. A display device, a user being allowed to wear the display device, the display device comprising: a memory configured to store a plurality of schedule information and categories of places associated with the schedule information; a sensor configured to obtain position information for specifying a position of the display device; an imaging device configured to obtain images of surroundings of the display device; and a processing circuit, wherein the processing circuit is configured to: determine whether there is a real object indicating a time or date from the obtained images obtained by the imaging device, in response to determining that there is the real object indicating the time or date, extract one of the categories of places from the memory based on the position information obtained by the sensor, extract schedule information associated with the extracted one of the categories of places, and display the extracted schedule information in accordance with a position of the real object indicating the time or date.

2. The display device according to claim 1, further comprising an internal clock configured to manage a time, wherein the real object indicating the time or date is a clock, and wherein the processing circuit is configured to: recognize a time of the clock from the obtained images obtained by the imaging device, compare the recognized time of the clock with the time managed by the internal clock, and display information based on a result of the comparison.

3. The display device according to claim 1, further comprising a line-of-sight detector configured to detect a line of sight of the user, wherein the processing circuit is configured to display the extracted schedule information in accordance with the position of the real object indicating the time or date when the line of sight detected by the line-of-sight detector corresponds to the position of the real object regarding the time or date.

4. The display device according to claim 1, wherein the memory is further configured to store map information, and wherein the processing circuit is configured to extract the one of the categories of places, using the map information stored in the memory, based on the position information obtained by the sensor.

5. The display device according to claim 1, wherein the schedule information includes schedule content and information regarding a time when the schedule content is to be executed.

6. The display device according to claim 1, wherein the categories of places includes a private

category.

7. The display device according to claim 1, further comprising: an internal clock configured to manage a time, wherein the real object indicating the time or date is a clock, and wherein the processing circuit is configured to: recognize a time of the clock from the obtained images obtained by the imaging device, compare the recognized time of the clock with the time managed by the internal clock, and in response to determining that the recognized time of the clock and the time managed by the internal clock are different by a predetermined error time or longer, display information indicating a difference.

8. A display method executed by a display device, a user being allowed to wear the display device, the display method comprising: storing a plurality of schedule information and categories of places associated with the schedule information; obtaining position information for specifying a position of the display device; obtaining images of surroundings of the display device; determining whether there is a real object indicating a time or date from the obtained images; extracting one of the stored categories of places based on the obtained position information in response to determining that there is the real object indicating the time or date; extracting schedule information associated with the one of the place categories from the stored schedule information; and displaying the extracted schedule information in accordance with a position of the real object indicating the time or date.

9. The display method according to claim 8, wherein the real object indicating the time or date is a clock, and wherein the display method further comprising: recognizing a time of the clock from the obtained images; comparing the recognized time of the clock with a time managed by an internal clock of the display device; and displaying information based on a result of the comparison.

10. The display method according to claim 8, the display method further comprising: detecting a line of sight of the user; and displaying the extracted schedule information in accordance with the position of the real object indicating the time or date when the detected line of sight corresponds to the position of the real object indicating the time or date.

11. The display method according to claim 8, the display method further comprising: storing map information; and extracting the one of the categories of places, using the stored map information, based on the obtained position information.

12. The display method according to claim 8, wherein the schedule information includes schedule content and information regarding a time when the schedule content is to be executed.

13. The display method according to claim 8, wherein the categories of places includes a private category.

14. The display method according to claim 8, wherein the real object indicating the time or date is a clock, and wherein the display method further comprising: recognizing a time of the clock from the obtained images; comparing the recognized time of the clock with a time managed by an internal clock of the display device; and in response to determining that the recognized time of the clock and the time managed by the internal clock are different by a predetermined error time or longer, displaying information indicating a difference.