TECHNICAL PROBLEM

[0005]

However, the conventional method is limited to a case in which a device to which the method is applied has three color light sources such as an illuminator. The present invention provides an information processing program or a reception program that solves this problem and enables communication between various devices including a device with low computational performance.

[0006]

According to a first aspect, a computer-implemented receiving method comprising setting a first exposure time for K exposure lines (K is an integer of 4 or more) included in an image sensor, and setting a second exposure time for a plurality of exposure lines which are a remainder of the K exposure lines, the second exposure time being shorter than the first exposure time; causing the image sensor to capture a

light transmitter and to obtain (i) a normal image from the K exposure lines with the first exposure time, and (ii) to obtain a bright line image from the remainder of the K exposure lines with the second exposure time within one frame, the bright line image including a plurality of bright lines each of which corresponds to a different one of a plurality of exposure lines included in the image sensor; and obtaining the plurality of transmission information sources by decoding a pattern of the plurality of the bright lines included in the obtained bright line image; and displaying the normal image on a display during the obtaining the plurality of transmission information sources.

[0006a]

According to a second aspect, an apparatus comprising a processor; and a memory having a computer program stored thereon, the computer program causing the processor to execute operations including: setting a first exposure time for K exposure lines (K is an integer of 4 or more) included in an image sensor, and setting a second exposure time for a plurality of exposure lines which are a remainder of the K exposure lines, the second exposure time being shorter than the first exposure time; causing the image sensor to capture a light transmitter and to obtain (i) a normal image from the K exposure lines with the first exposure time, and (ii) a bright line image from the remainder of the K exposure lines with the second exposure time within one frame, the bright line image including a plurality of bright lines each of which corresponds to a different one of a plurality of exposure lines included in the image sensor; obtaining a plurality of transmission information sources by decoding a pattern of the plurality of the bright lines included in the obtained bright line image; and displaying the normal image on a display during the obtaining the plurality of transmission information sources.

[0006b]

According to a third aspect, a non-transitory recording medium having a computer-program stored thereon, the computer program causing a processor to execute operations comprising setting a first exposure time for K exposure lines (K is an integer of 4 or more) included in an image sensor, and setting a second exposure time for a plurality of exposure lines which are a remainder of the K exposure lines, the second exposure time being shorter than the first exposure time; causing the image sensor to capture a light transmitter and to obtain (i) a normal image from the K exposure lines with the first exposure time, and (ii) a bright line image from the remainder of the K exposure lines with the second exposure time within one frame, the bright line image including a plurality of bright lines each of which corresponds to a

different one of a plurality of exposure lines included in the image sensor; and obtaining a plurality of transmission information sources by decoding a pattern of the plurality of the bright lines included in the obtained bright line image; and displaying the normal image on a display during the obtaining the plurality of transmission information sources.

[0007]

These general and specific aspects may be implemented using a system, a method, an integrated circuit, a computer program, or a computer-readable recording medium such as a CD-ROM, or any combination of systems, methods, integrated circuits, computer programs, or computer-readable recording media.

[0008]

An information communication method and a reception program disclosed herein provide an information processing program and a reception program that enable communication between various devices including a device with low computational

CLAIMS

1. A computer-implemented receiving method comprising:

setting a first exposure time for K exposure lines (K is an integer of 4 or more) included in an image sensor, and setting a second exposure time for a plurality of exposure lines which are a remainder of the K exposure lines, the second exposure time being shorter than the first exposure time;

causing the image sensor to capture a light transmitter and to obtain (i) a normal image from the K exposure lines with the first exposure time, and (ii) to obtain a bright line image from the remainder of the K exposure lines with the second exposure

time within one frame, the bright line image including a plurality of bright lines each of which corresponds to a different one of a plurality of exposure lines included in the image sensor; and

obtaining the plurality of transmission information sources by decoding a pattern of the plurality of the bright lines included in the obtained bright line image; and

displaying the normal image on a display during the obtaining the plurality of transmission information sources.

2. The computer-implemented receiving method according to claim 1,

wherein in the setting,

setting one of the first exposure time and the second exposure time for odd-numbered exposure lines included in the image sensor and,

setting the remaining one of the first exposure time and the second exposure time for even-numbered exposure lines.

3. The computer-implemented receiving method according to claim 2,

wherein in the setting,

setting the remaining one of the first exposure time and the second exposure time for the odd-numbered exposure lines after setting the one of the first exposure time and the second exposure time and,

setting the one of the first exposure time and the second exposure time for the even-numbered exposure lines after setting the remaining one of the first exposure time and the second exposure time.

4. The computer-implemented receiving method according to claim 2,

wherein in the setting,

setting the first exposure time and the second exposure time alternately for the odd-numbered exposure lines and,

setting the second exposure time for the even-numbered exposure lines when the first exposure time is set for the odd-numbered exposure lines, the first exposure time for the even-numbered exposure lines when the second exposure time is set for the odd-numbered exposure time.

5. The computer-implemented receiving method according to claim 2,

wherein in the setting,

a preset mode is switched between a normal imaging priority mode and a visible light imaging priority mode,

when the preset mode is switched to the normal imaging priority mode, a total number of exposure lines included in the image sensor for which the first exposure time is set is greater than a total number of exposure lines for which the second exposure time is set, and

when the preset mode is switched to the visible light imaging priority mode, the total number of exposure lines for which the first exposure time is set is less than the total number of exposure lines for which the second exposure time is set.

6. An apparatus comprising:

a processor; and

a memory having a computer program stored thereon, the computer program causing the processor to execute operations including:

setting a first exposure time for K exposure lines (K is an integer of 4 or more) included in an image sensor, and setting a second exposure time for a plurality of exposure lines which are a remainder of the K exposure lines, the second exposure time being shorter than the first exposure time;

causing the image sensor to capture a light transmitter and to obtain (i) a normal image from the K exposure lines with the first exposure time, and (ii) a bright line image from the remainder of the K exposure lines with the second exposure time within one frame, the bright line image including a plurality of bright lines each of which corresponds to a different one of a plurality of exposure lines included in the image sensor;

obtaining a plurality of transmission information sources by decoding a pattern of the plurality of the bright lines included in the obtained bright line image; and

displaying the normal image on a display during the obtaining the plurality of transmission information sources.

7. A non-transitory recording medium having a computer-program stored thereon, the computer program causing a processor to execute operations comprising:

setting a first exposure time for K exposure lines (K is an integer of 4 or more) included in an image sensor, and setting a second exposure time for a plurality of exposure lines which are a remainder of the K exposure lines, the second exposure time being shorter than the first exposure time;

causing the image sensor to capture a light transmitter and to obtain (i) a normal image from the K exposure lines with the first exposure time, and (ii) a bright line image from the remainder of the K exposure lines with the second exposure time within one frame, the bright line image including a plurality of bright lines each of which corresponds to a different one of a plurality of exposure lines included in the image sensor; and

obtaining a plurality of transmission information sources by decoding a pattern of the plurality of the bright lines included in the obtained bright line image; and

displaying the normal image on a display during the obtaining the plurality of transmission information sources.