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Inventor(s)	Ogura; Erina

Information processing apparatus, information processing system, information processing method, and program

Abstract

A processor of an information processing apparatus acquires a live view image and a pre-captured image based on a main-captured image, sets an imageable signal indicating that main imaging is determined to be executable based on at least one of a distance measurement result or a captured image, and outputs screen data. The live view image is displayed in a live view region included in a screen. A guide view region included in the screen includes a wide view region and a guide region. The pre-captured image is displayed in the wide view region. Guide information is displayed in the guide region. The processor outputs the screen data as data in which the screen includes an imaging instruction reception region in a case in which the imageable signal is set, and outputs a main imaging instruction signal in a case in which an imaging instruction is received by the imaging instruction reception region.

Inventors:	**Ogura; Erina (Kanagawa, JP)**
Applicant:	**FUJIFILM CORPORATION** (Tokyo, JP)
Family ID:	**1000008767400**
Assignee:	**FUJIFILM CORPORATION (Tokyo, JP)**
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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS (1) This application is a continuation application of International Application No. PCT/JP2022/005750, filed on Feb. 14, 2022, the disclosure of which is incorporated herein by reference in its entirety. Further, this application claims priority under 35 USC 119 from Japanese Patent Application No. 2021-058614, filed on Mar. 30, 2021, the disclosure of which is incorporated herein by reference in its entirety.

BACKGROUND
1. Technical Field
(1) The technology of the present disclosure relates to an information processing apparatus, an information processing system, an information processing method, and a program.
2. Related Art
(2) JP2012-029245A discloses an imaging apparatus including a first imaging unit that images a subject and outputs a signal according to the imaging result, a second imaging unit that images the subject at a wider angle than the first imaging unit and outputs a signal according to the imaging result, and a notification information output unit that outputs notification information according to a relationship between an imaging range of the first imaging unit and a position of a specific subject based on the output signal of the second imaging unit in a case in which the specific subject included in the subject is out of the imaging range of the first imaging unit.
(3) JP2013-013050A discloses an imaging apparatus including a first imaging optical system that acquires a first subject image, a second imaging optical system that can acquire a second subject image on a telephoto side of the first subject image acquired by the first imaging optical system, a first imaging unit that converts a video signal of the first subject image acquired by the first imaging optical system into first image data, a second imaging unit that converts a video signal of the second subject image acquired by the second imaging optical system into second image data, a display unit that displays the first subject image based on the first image data and the second subject image based on the second image data, and a controller that displays an imaging range of the second subject image on the first subject image displayed on the display unit with a display frame.
(4) JP2009-232276A discloses an imaging apparatus including an imaging unit that captures a subject image and continuously performing imaging processing such that a part of adjacent imaging ranges overlaps to generate a plurality of captured images. The imaging apparatus includes a display unit that continuously displays a subject image captured by the imaging unit as a live view image, a motion detection unit that detects motion of the live view image in at least one direction, an instruction unit that instructs a start of imaging processing, a display control unit that performs control to display a movement mark that moves according to the motion detected by the motion detection unit on the live view image after the start instruction instructed by the instruction unit, and a movement target mark including a movement target position of the movement mark and indicating a predetermined region near the movement target position, and a determination unit that determines whether or not imaging is possible based on time conversion of a predetermined physical quantity associated with the motion of the apparatus main body in the positioned state in a

case in which the movement mark is positioned within the predetermined region indicated by the movement target mark. The imaging apparatus permits the start instructed by the instruction unit in a case in which the determination unit determines that the imaging is possible, and performs the imaging processing.

SUMMARY

(5) One embodiment according to the technology of the present disclosure provides an information processing apparatus, an information processing system, an information processing method, and a program that can cause an imaging apparatus to execute imaging at a good timing as compared with a case in which a timing determined without using either the distance measurement result or the captured image is notified as an imaging timing.

(6) A first aspect according to the technology of the present disclosure is an information processing apparatus comprising a processor, and a memory connected to or built in the processor, in which the processor acquires a live view image obtained by imaging an imaging scene by an imaging apparatus having a distance measurement function and a pre-captured image based on a main-captured image obtained by executing main imaging by the imaging apparatus, sets an imageable signal indicating that the main imaging is determined to be executable based on at least one of a distance measurement result obtained by the distance measurement function or a captured image obtained by imaging with the imaging apparatus, and outputs screen data for displaying a screen including a live view region and a guide view region on a first display, the live view image is displayed in the live view region, the guide view region includes a wide view region and a guide region, the pre-captured image is displayed in the wide view region, guide information that is capable of specifying an image region corresponding to the live view image displayed in the live view region within the wide view region is displayed in the guide region, and the processor outputs the screen data as data in which the screen includes an imaging instruction reception region of a display aspect for notifying that the main imaging is executable, in a case in which the imageable signal is set, and outputs a main imaging instruction signal indicating an instruction to cause the imaging apparatus to execute the main imaging for the imaging scene indicated by the live view image, in a case in which an imaging instruction is received by the imaging instruction reception region.

(7) A second aspect according to the technology of the present disclosure is the information processing apparatus according to the first aspect, in which the pre-captured image is an image indicating a scene wider than the imaging scene indicated by the live view image displayed in the live view region.

(8) A third aspect according to the technology of the present disclosure is the information processing apparatus according to the second aspect, in which the pre-captured image is a composite image obtained by joining a plurality of the main-captured images into a panoramic image.

(9) A fourth aspect according to the technology of the present disclosure is the information processing apparatus according to the third aspect, in which the screen includes a composite image confirmation view region in which the wide view region is enlarged together with the composite image.

(10) A fifth aspect according to the technology of the present disclosure is the information processing apparatus according to the fourth aspect, in which the screen includes a real space area of an imaging region indicated by the composite image.

(11) A sixth aspect according to the technology of the present disclosure is the information processing apparatus according to any one aspect of the first aspect to the fifth aspect, in which the processor outputs a distance measurement result acquisition instruction signal indicating an instruction to cause the imaging apparatus to acquire the distance measurement result.

(12) A seventh aspect according to the technology of the present disclosure is the information processing apparatus according to the sixth aspect, in which the distance measurement result

acquisition instruction signal includes a signal indicating an instruction to cause the imaging apparatus to measure a distance between a first imaging target, which is imaged by the imaging apparatus, and the imaging apparatus as one of the distance measurement results.

(13) An eighth aspect according to the technology of the present disclosure is the information processing apparatus according to any one aspect of the first aspect to the seventh aspect, in which the imageable signal is generated on condition that an angle formed by a first imaging target surface imaged by the imaging apparatus and a predetermined surface included in the imaging apparatus is a facing angle at which the first imaging target surface and the imaging apparatus face each other.

(14) A ninth aspect according to the technology of the present disclosure is the information processing apparatus according to the eighth aspect, in which the imaging apparatus has an image sensor, and the predetermined surface is a surface corresponding to an imaging surface of the image sensor.

(15) A tenth aspect according to the technology of the present disclosure is the information processing apparatus according to any one aspect of the first aspect to the ninth aspect, in which the imageable signal is generated on condition that an overlap ratio between the pre-captured image and the main-captured image or the live view image is within a predetermined range.

(16) An eleventh aspect according to the technology of the present disclosure is the information processing apparatus according to any one aspect of the first aspect to the tenth aspect, in which the processor acquires information based on the distance measurement result.

(17) A twelfth aspect according to the technology of the present disclosure is the information processing apparatus according to the eleventh aspect, in which the information based on the distance measurement result includes information indicating whether or not a second imaging target surface imaged by the imaging apparatus and the imaging apparatus face each other.

(18) A thirteenth aspect according to the technology of the present disclosure is the information processing apparatus according to the eleventh or twelfth aspect, in which the information based on the distance measurement result includes information based on a distance between a second imaging target surface imaged by the imaging apparatus and the imaging apparatus.

(19) A fourteenth aspect according to the technology of the present disclosure is the information processing apparatus according to any one aspect of the eleventh aspect to the thirteenth aspect, in which the processor outputs distance measurement result data for causing a second display to display the information based on the distance measurement result.

(20) A fifteenth aspect according to the technology of the present disclosure is the information processing apparatus according to the fourteenth aspect, in which the information based on the distance measurement result is displayed on the second display in a message format.

(21) A sixteenth aspect according to the technology of the present disclosure is the information processing apparatus according to any one aspect of the first aspect to the fifteenth aspect, in which the imaging apparatus has a release button in a lock state, and the processor outputs an unlock instruction signal for causing the imaging apparatus to release the lock state, in a case in which the imageable signal is set.

(22) A seventeenth aspect according to the technology of the present disclosure is an information processing system comprising the information processing apparatus according to any one aspect of the first aspect to the sixteenth aspect, and a reception device that receives an instruction given to the processor.

(23) An eighteenth aspect according to the technology of the present disclosure is the information processing system according to the seventeenth aspect, further comprising the imaging apparatus.

(24) A nineteenth aspect according to the technology of the present disclosure is an information processing method comprising acquiring a live view image obtained by imaging an imaging scene by an imaging apparatus having a distance measurement function and a pre-captured image based on a main-captured image obtained by executing main imaging by the imaging apparatus, setting

an imageable signal indicating that the main imaging is determined to be executable based on at least one of a distance measurement result obtained by the distance measurement function or a captured image obtained by imaging with the imaging apparatus, and outputting screen data for displaying a screen including a live view region and a guide view region on a first display, in which the live view image is displayed in the live view region, the guide view region includes a wide view region and a guide region, the pre-captured image is displayed in the wide view region, guide information that is capable of specifying an image region corresponding to the live view image displayed in the live view region within the wide view region is displayed in the guide region, and the information processing method further comprises outputting the screen data as data in which the screen includes an imaging instruction reception region of a display aspect for notifying that the main imaging is executable, in a case in which the imageable signal is set, and outputting a main imaging instruction signal indicating an instruction to cause the imaging apparatus to execute the main imaging for the imaging scene indicated by the live view image, in a case in which an imaging instruction is received by the imaging instruction reception region.

(25) A twentieth aspect of the technology of the present disclosure is a program for causing a computer to execute a process comprising acquiring a live view image obtained by imaging an imaging scene by an imaging apparatus having a distance measurement function and a pre-captured image based on a main-captured image obtained by executing main imaging by the imaging apparatus, setting an imageable signal indicating that the main imaging is determined to be executable based on at least one of a distance measurement result obtained by the distance measurement function or a captured image obtained by imaging with the imaging apparatus, and outputting screen data for displaying a screen including a live view region and a guide view region on a first display, in which the live view image is displayed in the live view region, the guide view region includes a wide view region and a guide region, the pre-captured image is displayed in the wide view region, guide information that is capable of specifying an image region corresponding to the live view image displayed in the live view region within the wide view region is displayed in the guide region, and the process further comprises outputting the screen data as data in which the screen includes an imaging instruction reception region of a display aspect for notifying that the main imaging is executable, in a case in which the imageable signal is set, and outputting a main imaging instruction signal indicating an instruction to cause the imaging apparatus to execute the main imaging for the imaging scene indicated by the live view image, in a case in which an imaging instruction is received by the imaging instruction reception region.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) Exemplary embodiments of the technology of the disclosure will be described in detail based on the following figures, wherein:
(2) FIG. **1** is a schematic configuration diagram illustrating an example of a configuration of an entire inspection system;
(3) FIG. **2** is a schematic configuration diagram illustrating an example of a hardware configuration of an electrical system of an information processing apparatus;
(4) FIG. **3** is a schematic configuration diagram illustrating an example of a hardware configuration of an electrical system of a tablet terminal;
(5) FIG. **4** is a schematic configuration diagram illustrating an example of hardware configurations of an optical system and an electrical system of an imaging apparatus;
(6) FIG. **5** is a schematic configuration diagram illustrating an example of a hardware configuration of the electric system of the imaging apparatus;
(7) FIG. **6** is a schematic configuration diagram illustrating an example of a hardware configuration

of a biaxial revolution mechanism;

(8) FIG. **7** is a schematic configuration diagram illustrating an example of a hardware configuration of a vehicle;

(9) FIG. **8** is a schematic configuration diagram illustrating an example of a hardware configuration of a lifting device;

(10) FIG. **9** is a block diagram illustrating an example of a function of a main part of a processor of the information processing apparatus;

(11) FIG. **10** is a block diagram illustrating an example of a function of a main part of a processor of the imaging apparatus;

(12) FIG. **11** is a block diagram illustrating an example of a function of a main part of a processor of the tablet terminal;

(13) FIG. **12** is a schematic screen diagram illustrating an example of various screens displayed on a touch panel display of the tablet terminal;

(14) FIG. **13** is a conceptual diagram illustrating an example of a processing content for displaying a startup setting screen and a processing content using the startup setting screen;

(15) FIG. **14** is a conceptual diagram illustrating an example of a processing content using the startup setting screen;

(16) FIG. **15** is a conceptual diagram illustrating an example of a flow of a distance measurement instruction signal;

(17) FIG. **16** is a conceptual diagram illustrating an example of a processing content using a distance measurement result;

(18) FIG. **17** is a conceptual diagram illustrating an example of a flow of a live view imaging instruction signal;

(19) FIG. **18** is a conceptual diagram illustrating an example of a processing content related to a live view image and imaging start screen data;

(20) FIG. **19** is a schematic screen diagram illustrating an example of an imaging start screen;

(21) FIG. **20** is a schematic perspective diagram illustrating an example of a structure of the imaging start screen;

(22) FIG. **21** is a conceptual diagram illustrating an example of a processing content related to the imaging start screen data;

(23) FIG. **22** is a conceptual diagram illustrating an example of a processing content in a case in which an instruction reception region included in the imaging start screen is tapped;

(24) FIG. **23** is a conceptual diagram illustrating an example of a processing content related to an imaging condition confirmation signal;

(25) FIG. **24** is a conceptual diagram illustrating an example of a processing content related to movement guidance screen data;

(26) FIG. **25** is a schematic screen diagram illustrating an example of a movement guidance screen;

(27) FIG. **26** is a conceptual diagram illustrating an example of an aspect in which an instruction is given to an instruction reception region included in the movement guidance screen;

(28) FIG. **27** is a conceptual diagram illustrating an example of a processing content related to zoom guidance screen data;

(29) FIG. **28** is a schematic screen diagram illustrating an example of a telescopic zoom guidance screen;

(30) FIG. **29** is a schematic screen diagram illustrating an example of a wide angle zoom guidance screen;

(31) FIG. **30** is a conceptual diagram illustrating an example of an aspect in which an instruction is given to an instruction reception region included in the zoom guidance screen;

(32) FIG. **31** is a conceptual diagram illustrating an example of a processing content related to inclination adjustment guidance screen data;

(33) FIG. **32** is a schematic screen diagram illustrating an example of an inclination adjustment

guidance screen;

(34) FIG. **33** is a conceptual diagram illustrating an example of an aspect in which an instruction is given to an instruction reception region included in the inclination adjustment guidance screen;

(35) FIG. **34** is a conceptual diagram illustrating an example of a processing content until an adjustment result signal is obtained;

(36) FIG. **35** is a conceptual diagram illustrating an example of a processing content in a case in which a drive system and the imaging apparatus are controlled in accordance with the adjustment result signal;

(37) FIG. **36** is a conceptual diagram illustrating an example of a processing content in which an imageable signal is set;

(38) FIG. **37** is a conceptual diagram illustrating an example of a processing content related to imaging permission screen data;

(39) FIG. **38** is a schematic screen diagram illustrating an example of an imaging permission screen;

(40) FIG. **39** is a conceptual diagram illustrating an example of a processing content for displaying the imaging permission screen on a touch panel display;

(41) FIG. **40** is a conceptual diagram illustrating an example of a processing content until a main imaging instruction signal is obtained;

(42) FIG. **41** is a conceptual diagram illustrating an example of a flow of the main imaging instruction signal;

(43) FIG. **42** is a conceptual diagram illustrating an example of a processing content until screen data including a composite image is obtained;

(44) FIG. **43** is a conceptual diagram illustrating an example of an aspect in which the imaging start screen and a composition confirmation screen are switched;

(45) FIG. **44**A is a flowchart illustrating an example of a flow of tablet side processing;

(46) FIG. **44**B is the continuation of the flowchart illustrated in FIG. **44**A;

(47) FIG. **44**C is the continuation of the flowchart illustrated in FIGS. **44**A and **44**B;

(48) FIG. **45**A is a flowchart illustrating an example of a flow of inspection support processing;

(49) FIG. **45**B is the continuation of the flowchart illustrated in FIG. **45**A;

(50) FIG. **45**C is the continuation of the flowchart illustrated in FIG. **45**B;

(51) FIG. **45**D is the continuation of the flowchart illustrated in FIG. **45**C;

(52) FIG. **46** is a flowchart illustrating an example of a flow of imaging apparatus side processing;

(53) FIG. **47** is a conceptual diagram illustrating an example of a processing content until screen data in which a real space area is included in a screen is obtained;

(54) FIG. **48** is a schematic screen diagram illustrating an example of the composition confirmation screen on which the real space area is displayed;

(55) FIG. **49** is a conceptual diagram illustrating an example of a processing content until screen data in which distance measurement result data is included in the screen is obtained;

(56) FIG. **50** is a conceptual diagram illustrating an example of a processing content performed for releasing a lock state of a release button; and

(57) FIG. **51** is a conceptual diagram illustrating an example of an aspect in which an inspection support processing program stored in a storage medium is installed in a computer of an information processing apparatus **30**.

DETAILED DESCRIPTION

(58) Hereinafter, an example of embodiments of an information processing apparatus, an information processing system, an information processing method, and a program according to the technology of the present disclosure will be explained with reference to the accompanying drawings.

(59) First, the wording used in the following explanation will be explained.

(60) CPU is an abbreviation stands for "Central Processing Unit". GPU is an abbreviation stands

for "Graphics Processing Unit". NVM is an abbreviation stands for "Non-Volatile memory". RAM is an abbreviation stands for "Random Access Memory". IC is an abbreviation stands for "Integrated Circuit". ASIC is an abbreviation stands for "Application Specific Integrated Circuit". PLD is an abbreviation stands for "Programmable Logic Device". FPGA is an abbreviation stands for "Field-Programmable Gate Array". SoC is an abbreviation stands for "System-on-a-chip". SSD is an abbreviation stands for "Solid State Drive". USB is an abbreviation stands for "Universal Serial Bus". HDD is an abbreviation stands for "Hard Disk Drive". EEPROM is an abbreviation stands for "Electrically Erasable and Programmable Read Only Memory". EL is an abbreviation stands for "Electro-Luminescence". I/F is an abbreviation stands for "Interface". UI is an abbreviation stands for "User Interface". fps is an abbreviation stands for "frame per second". MF is an abbreviation stands for "Manual Focus". AF is an abbreviation stands for "Auto Focus". CMOS is an abbreviation stands for "Complementary Metal Oxide Semiconductor". LAN is an abbreviation stands for "Local Area Network". WAN is an abbreviation stands for "Wide Area Network". CNN is an abbreviation stands for "Convolutional Neural Network". AI is an abbreviation stands for "Artificial Intelligence". TOF is an abbreviation stands for "Time Of Flight". 3D is an abbreviation stands for "3 Dimensions". 5G is an abbreviation stands for "5th Generation". In the explanation of the present specification, "matching" refers to matching in a sense including an error generally allowed in the technical field to which the technology of the present disclosure belongs, that is the error to the extent that it does not contradict the purpose of the technology of the present disclosure, in addition to the exact matching.

(61) As an example, as illustrated in FIG. **1**, an inspection system **10** comprises an information processing system **12** and a drive system **14**, and inspects an inspection object **16**. The inspection refers, for example, to an inspection of a state of the inspection object **16**. For example, a presence or absence of damage of the inspection object **16** and/or a degree of the damage, and the like are inspected by the inspection system **10**. The inspection object **16** is an example of an "imaging scene" according to the technology of the present disclosure.

(62) The drive system **14** comprises a biaxial revolution device **18**, a vehicle **20**, and a lifting device **22**. Each of the biaxial revolution device **18**, the vehicle **20**, and the lifting device **22** has a communication function. The biaxial revolution device **18**, the vehicle **20**, and the lifting device **22** are connected to the information processing system **12** in a communicable manner and operate under the control of the information processing system **12**.

(63) In the example illustrated in FIG. **1**, a vehicle **24** with a gondola is illustrated. The vehicle **24** with a gondola has the vehicle **20**, the lifting device **22**, and a gondola **26**. For example, the vehicle **20** is a four-wheeled vehicle with an electric motor having four wheels **20**A. The vehicle **20** travels in accordance with instructions given from the outside. Traveling refers to forward movement, backward movement, and meandering, for example.

(64) The lifting device **22** is, for example, a pantograph type lift. The lifting device **22** has a pantograph mechanism **28**. The pantograph mechanism **28** is a mechanism that expands and contracts in a vertical direction. The pantograph mechanism **28** is attached to an upper portion of the vehicle **20**. That is, one end portion **28**A of the pantograph mechanism **28** is attached to an upper portion **20**B of the vehicle **20**. The other end **28**B of the pantograph mechanism **28** is attached to a lower surface **26**A of the gondola **26**, and the gondola **26** is supported from below by the pantograph mechanism **28**. The lifting device **22** raises and lowers the gondola **26** along the vertical direction by expanding and contracting the pantograph mechanism **28** in accordance with the instruction given from the outside.

(65) In the example illustrated in FIG. **1**, the vehicle **24** with a gondola is illustrated, but this is merely an example, and it may be a moving apparatus that moves at least the imaging apparatus **34** of the information processing apparatus **30**, the tablet terminal **32**, or the imaging apparatus **34** in the vertical direction and a horizontal direction, such as a vehicle for work at height, a bridge inspection vehicle, an electric slider with a lifting device, or a carriage with a lifting device.

(66) The information processing system **12** comprises an information processing apparatus **30**, a tablet terminal **32**, and an imaging apparatus **34**. The information processing apparatus **30** and the imaging apparatus **34** are installed in the gondola **26**.

(67) The information processing apparatus **30** is, for example, a laptop personal computer. Here, the laptop personal computer is illustrated, but this is merely an example, and a desktop personal computer may be used. In addition, it is not limited to a personal computer and may be a server. The server may be a mainframe used on-premises together with the imaging apparatus **34** or may be an external server implemented by cloud computing. In addition, the server may be an external server implemented by network computing such as fog computing, edge computing, or grid computing. In the example illustrated in FIG. **1**, the information processing apparatus **30** is installed in the gondola **26**, but this is merely an example and the information processing apparatus **30** may be installed outside the gondola **26**.

(68) The imaging apparatus **34** is, for example, a lens-interchangeable digital camera. Here, the lens-interchangeable digital camera is illustrated as the imaging apparatus **34**, but this is merely an example and a digital camera built in various electronic apparatuses such as a smart device or a wearable terminal may be used.

(69) The imaging apparatus **34** images the inspection object **16** in accordance with the instruction given from the outside. In addition, the imaging apparatus **34** is an apparatus having a distance measurement function. The imaging apparatus **34** has a 3D sensor **38**, and the distance measurement function is implemented by the 3D sensor **38**. The 3D sensor **38** selectively executes the distance measurement of a stereo camera method and the distance measurement of a TOF method in accordance with the instruction given from the outside. In the present embodiment, distance measurement refers to measurement of a distance from the imaging apparatus **34** to the inspection object **16**. In the following, for convenience of explanation, the explanation will be made on the premise that calibration has been executed in advance for the imaging apparatus **34** to match a coordinate system applied to the distance measurement by the 3D sensor **38** with a coordinate system applied to the imaging by the imaging apparatus **34**.

(70) The biaxial revolution device **18** is attached to a fence **26**B of the gondola **26**. The imaging apparatus **34** is installed in the biaxial revolution device **18** to allow revolution. The biaxial revolution device **18** operates in accordance with the instruction given from the outside to pan or tilt the imaging apparatus **34**. The biaxial revolution device **18** has a pan mechanism **40** and a tilt mechanism **42**. The pan mechanism **40** has a pan axis PA. The tilt mechanism **42** has a tilt axis TA. The pan mechanism **40** implements panning of the imaging apparatus **34** by revolving the imaging apparatus **34** around the pan axis PA, and the tilt mechanism **42** implements tilting of the imaging apparatus **34** by revolving the imaging apparatus **34** around the tilt axis TA.

(71) The tablet terminal **32** is a mobile device having a touch panel type reception I/F and a communication function. The tablet terminal **32** is used by a user **36** who is boarding the gondola **26**. In the example illustrated in FIG. **1**, the tablet terminal **32** is used by the user **36** inside the gondola **26**, but the tablet terminal **32** may be used by the user **36** outside the gondola **26**.

(72) The information processing system **12** is an example of an "information processing system" according to the technology of the present disclosure. The information processing apparatus **30** is an example of an "information processing apparatus" according to the technology of the present disclosure. The tablet terminal **32** is an example of a "reception device" according to the technology of the present disclosure. The imaging apparatus **34** is an example of an "imaging apparatus" according to the technology of the present disclosure. The inspection object **16** is an example of a "first imaging target" and a "second imaging target" according to the technology of the present disclosure.

(73) The information processing apparatus **30** is connected to the tablet terminal **32** and the imaging apparatus **34** in a communicable manner. The user **36** gives an instruction to the information processing apparatus **30** through the tablet terminal **32** to cause the information

processing apparatus **30** to execute various types of processing.

(74) Here, the various types of processing refer, for example, to processing of causing the imaging apparatus **34** to image the inspection object **16**, processing of causing the imaging apparatus **34** to execute the distance measurement of the inspection object **16**, processing of operating the drive system **14**, image processing, or the like.

(75) The image processing includes screen generation processing, composition processing, inspection processing, or the like. The screen generation processing is, for example, processing of generating various screens according to the intended use. The composition processing is, for example, processing of generating a panoramic image by connecting and joining a plurality of captured images obtained by imaging with the imaging apparatus **34** in a longitudinal direction and a transverse direction (for example, the vertical direction and the horizontal direction).

(76) The inspection processing includes, for example, choke detection processing and damage detection processing. In the choke detection processing and the damage detection processing, for example, the panoramic image obtained by image processing is used. The choke detection processing is processing of detecting a choke mark drawn with a choke on the inspection object **16** included as an image in the panoramic image. The damage detection processing is processing of detecting damage (for example, fissuring and/or rust) of the inspection object **16** included as an image in the panoramic image. The choke detection processing is implemented by, for example, template matching type subject recognition processing, and the damage detection processing is implemented by, for example, an AI type subject recognition processing.

(77) As described above, since the subject recognition processing is used in the inspection processing, it is preferable that the panoramic image has no missing part in order to improve the accuracy of the inspection processing. Examples of the missing part include a gap (that is, a blank region) caused by a failure in connecting the plurality of captured images.

(78) In order to connect the plurality of captured images without a gap, it is preferable that the inclination and size are matched between the adjacent captured images, and that a predetermined amount (for example, about 30% of one frame) is overlapped without misregistration in the connection direction (for example, the longitudinal direction and the transverse direction), and then the imaging is executed by the imaging apparatus **34** frame by frame. One of the reasons for the overlap is that, in the connection processing, matching feature points between adjacent captured images are referenced and used to connect them. Therefore, a certain number of feature points are required for that purpose.

(79) In order to obtain a plurality of captured images that satisfy a predetermined condition as a condition for obtaining a panoramic image having no missing part with respect to the inclination, the size, and the overlap amount, it is required to cause the imaging apparatus **34** to execute imaging at good timing (that is, the timing satisfying the predetermined condition as a condition for obtaining the panoramic image having no missing part with respect to the inclination, the size, and the overlap amount).

(80) As described above, in order to cause the imaging apparatus **34** to execute imaging at the good timing, the inspection system **10** comprises the configurations illustrated in FIGS. **2** to **43** as an example.

(81) As an example, as illustrated in FIG. **2**, the information processing apparatus **30** comprises a computer **44**, a reception device **46**, a display **48**, an external I/F **50**, a first communication I/F **52**, a second communication I/F **54**, a third communication I/F **56**, a fourth communication I/F **58**, and a fifth communication I/F **60**.

(82) The computer **44** is an example of a "computer" according to the technology of the present disclosure. The computer **44** comprises a processor **62**, a storage **64**, and a RAM **66**. The processor **62** is an example of a "processor" according to the technology of the present disclosure, and the RAM **66** is an example of a "memory" according to the technology of the present disclosure.

(83) The processor **62**, the storage **64**, the RAM **66**, the external I/F **50**, the first communication I/F

52, the second communication I/F **54**, the third communication I/F **56**, the fourth communication I/F **58**, and the fifth communication I/F **60** are connected to a bus **68**. In the example illustrated in FIG. **2**, one bus is illustrated as the bus **68** for convenience of illustration, but a plurality of buses may be used. The bus **68** may be a serial bus or may be a parallel bus including a data bus, an address bus, a control bus, or the like.

(84) For example, the processor **62** has a CPU and a GPU and controls the entire information processing apparatus **30**. The GPU operates under the control of the CPU, and is responsible for performing the image processing.

(85) The storage **64** is a non-volatile storage device that stores various programs, various parameters, or the like. Examples of the storage **64** include an HDD and an SSD. The HDD and the SSD are merely examples, and a flash memory, a magnetic resistance memory, and/or a strong dielectric memory may be used instead of the HDD and/or the SSD or together with the HDD and/or the SSD.

(86) The RAM **66** is a memory where information is temporarily stored, and is used as a work memory by the processor **62**. Examples of the RAM **66** include a DRAM and/or an SRAM, and the like.

(87) The reception device **46** has a keyboard, a mouse, a touch panel, and the like, and receives an instruction from a user **36** (refer to FIG. **1**). The display **48** displays various types of information (for example, an image and a character) under the control of the processor **62**. Examples of the display **48** include an EL display (for example, an organic EL display or an inorganic EL display). The display is not limited to the EL display, and another type of display, such as a liquid crystal display, may be used.

(88) The external I/F **50** controls exchange of various types of information with a device (for example, a smart device, a personal computer, a server, a USB memory, a memory card, and/or a printer) existing outside the information processing apparatus **30**. An example of the external I/F **50** is a USB interface. Various devices (not illustrated), such as a smart device, a personal computer, a server, a USB memory, a memory card, and/or a printer, are directly or indirectly connected to the USB interface.

(89) The first communication I/F **52** is connected to the tablet terminal **32** in a communicable manner. Here, the first communication I/F **52** is connected to the tablet terminal **32** so as to be capable of wireless communication by a predetermined wireless communication standard. Examples of the predetermined wireless communication standard include Bluetooth (registered trademark). It may be a wireless communication standard other than this (for example, Wi-Fi, 5G, or the like). Here, although wireless communication is illustrated, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The first communication I/F **52** controls the exchange of the information with the tablet terminal **32**. For example, the first communication I/F **52** transmits the information in response to a request from the processor **62** to the tablet terminal **32**. In addition, the first communication I/F **52** receives the information transmitted from the tablet terminal **32** to output the received information to the processor **62** via the bus **68**.

(90) The second communication I/F **54** is connected to the imaging apparatus **34** in a communicable manner. Here, the second communication I/F **54** is connected to the tablet terminal **32** so as to be capable of wireless communication by a predetermined wireless communication standard. In addition, although wireless communication is illustrated here, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The second communication I/F **54** controls the exchange of the information with the imaging apparatus **34**. For example, the second communication I/F **54** transmits the information in response to a request from the processor **62** to the imaging apparatus **34**. In addition, the second communication I/F **54** receives the information transmitted from the imaging apparatus **34** to output the received information to the processor **62** via the bus **68**.

(91) The third communication I/F **56** is connected to the biaxial revolution device **18** in a communicable manner. Here, the third communication I/F **56** is connected to the biaxial revolution device **18** so as to be capable of wireless communication by a predetermined wireless communication standard. In addition, although wireless communication is illustrated here, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The third communication I/F **56** controls the exchange of the information with the biaxial revolution device **18**. For example, the third communication I/F **56** transmits the information in response to a request from the processor **62** to the biaxial revolution device **18**. In addition, the third communication I/F **56** receives the information transmitted from the biaxial revolution device **18** to output the received information to the processor **62** via the bus **68**.

(92) The fourth communication I/F **58** is connected to the vehicle **20** in a communicable manner. Here, the fourth communication I/F **58** is connected to the vehicle **20** so as to be capable of wireless communication by a predetermined wireless communication standard. In addition, although wireless communication is illustrated here, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The fourth communication I/F **58** controls the exchange of the information with the vehicle **20**. For example, the fourth communication I/F **58** transmits the information in response to a request from the processor **62** to the vehicle **20**. In addition, the fourth communication I/F **58** receives the information transmitted from the vehicle **20** to output the received information to the processor **62** via the bus **68**.

(93) The fifth communication I/F **60** is connected to the lifting device **22** in a communicable manner. Here, the fifth communication I/F **60** is connected to the lifting device **22** so as to be capable of wireless communication by a predetermined wireless communication standard. In addition, although wireless communication is illustrated here, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The fifth communication I/F **60** controls the exchange of the information with the lifting device **22**. For example, the fifth communication I/F **60** transmits the information in response to a request from the processor **62** to the vehicle **20**. In addition, the fifth communication I/F **60** receives the information transmitted from the lifting device **22** to output the received information to the processor **62** via the bus **68**.

(94) As an example, as illustrated in FIG. **3**, the tablet terminal **32** comprises a computer **70**, a touch panel display **72**, an external I/F **74**, and a communication I/F **76**.

(95) The computer **70** comprises a processor **78**, a storage **80**, and a RAM **82**. The processor **78**, the storage **80**, and the RAM **82** are connected to a bus **84**. In the example illustrated in FIG. **3**, one bus is illustrated as the bus **84** for convenience of illustration, but a plurality of buses may be used. The bus **84** may be a serial bus or may be a parallel bus including a data bus, an address bus, a control bus, or the like.

(96) For example, the processor **78** has a CPU and a GPU and controls the entire tablet terminal **32**. The GPU operates under the control of the CPU, and is responsible for performing the image processing.

(97) The storage **80** is a non-volatile storage device that stores various programs, various parameters, or the like. Examples of the storage **80** include a flash memory and an SSD. The flash memory and the SSD are merely examples, and an HDD, a magnetic resistance memory, and/or a strong dielectric memory may be used instead of the flash memory and/or the SSD or together with the flash memory and/or the SSD.

(98) The RAM **82** is a memory where information is temporarily stored, and is used as a work memory by the processor **78**. Examples of the RAM **82** include a DRAM and/or an SRAM, and the like.

(99) The touch panel display **72** has a touch panel **86** and a display **88**. An example of the display

88 is an EL display. The display is not limited to the EL display, and another type of display, such as a liquid crystal display, may be used.

(100) The touch panel display **72** is formed by superimposing the touch panel **86** on a display region of the display **88** or by forming an in-cell type in which a touch panel function is built in the display **88**. The in-cell type is merely an example, and an out-cell type or an on-cell type may be used.

(101) The external I/F **74** controls exchange of various types of information with a device (for example, a smart device, a personal computer, a server, a USB memory, a memory card, and/or a printer) existing outside the tablet terminal **32**. An example of the external I/F **74** is a USB interface. Various devices (not illustrated), such as a smart device, a personal computer, a server, a USB memory, a memory card, and/or a printer, are directly or indirectly connected to the USB interface.

(102) The communication I/F **76** is connected to the information processing apparatus **30** in a communicable manner. Here, the communication I/F **76** is connected to the first communication I/F **52** of the information processing apparatus **30** so as to be capable of wireless communication by a predetermined wireless communication standard. Here, although wireless communication is illustrated, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The communication I/F **76** controls the exchange of the information between the processor **62** of the information processing apparatus **30** and the processor **78** of the tablet terminal **32**. For example, the communication I/F **76** transmits the information in response to a request from the processor **78** to the information processing apparatus **30**. In addition, the communication I/F **76** receives the information transmitted from the processor **62** of the information processing apparatus **30** via the first communication I/F **52** to output the received information to the processor **78** via the bus **84**.

(103) The tablet terminal **32** performs processing according to an instruction received from the user **36** (refer to FIG. **1**) by the touch panel display **72**. For example, the tablet terminal **32** exchanges various types of information with the information processing apparatus **30** in accordance with an instruction received by the touch panel display **72**. For example, the tablet terminal **32** receives the image transmitted from the information processing apparatus **30** to display the received image on the touch panel display **72**.

(104) As an example, as illustrated in FIG. **4**, the imaging apparatus **34** comprises an interchangeable lens **90** and an imaging apparatus main body **92**. The interchangeable lens **90** is interchangeably mounted to the imaging apparatus main body **92**.

(105) The imaging apparatus main body **92** comprises an image sensor **94**. The image sensor **94** is a CMOS image sensor. The image sensor **94** images a subject (for example, the inspection object **16** illustrated in FIG. **1**). In a case in which the interchangeable lens **90** is mounted to the imaging apparatus main body **92**, subject light indicating the subject is transmitted through the interchangeable lens **90** and imaged on the image sensor **94**, and then image data indicating an image of the subject is generated by the image sensor **94**.

(106) Here, although the CMOS image sensor is exemplified as the image sensor **94**, the technology of the present disclosure is not limited to this, and other image sensors may be used.

(107) The image sensor **94** comprises a photoelectric conversion element **96**. The photoelectric conversion element **96** has a light-receiving surface **96**A. The photoelectric conversion element **96** is disposed in the imaging apparatus main body **92** such that the center of the light-receiving surface **96**A matches an optical axis OA. The photoelectric conversion element **96** has a plurality of photosensitive pixels disposed in a matrix shape, and the light-receiving surface **96**A is formed by the plurality of photosensitive pixels. The photosensitive pixel is a physical pixel having a photodiode (not illustrated), which photoelectrically converts the received light and outputs an electric signal according to the light-receiving amount.

(108) The interchangeable lens **90** comprises an imaging lens **98**. The imaging lens **98** has an

objective lens **98**A, a focus lens **98**B, a zoom lens **98**C, and a stop **98**D. The objective lens **98**A, the focus lens **98**B, the zoom lens **98**C, and the stop **98**D are disposed in the order of the objective lens **98**A, the focus lens **98**B, the zoom lens **98**C, and the stop **98**D along the optical axis OA from a subject side (object side) to the imaging apparatus main body **92** side (image side).

(109) The interchangeable lens **90** comprises a control device **102**, a first actuator **104**, a second actuator **106**, and a third actuator **108**. The control device **102** controls the entire interchangeable lens **90** in accordance with an instruction from the imaging apparatus main body **92**. The control device **102** is a device having a computer including, for example, a CPU, an NVM, a RAM, and the like. Here, although the computer is exemplified, this is merely an example, and a device including an ASIC, an FPGA, and/or a PLD may be applied. In addition, as the control device **102**, for example, a device implemented by a combination of a hardware configuration and a software configuration may be used.

(110) The first actuator **104** comprises a slide mechanism for focus (not illustrated) and a motor for focus (not illustrated). The focus lens **98**B is mounted to the slide mechanism for focus so as to be slidable along the optical axis OA. In addition, the motor for focus is connected to the slide mechanism for focus, and the slide mechanism for focus operates by receiving the power of the motor for focus to move the focus lens **98**B along the optical axis OA.

(111) The second actuator **106** comprises a slide mechanism for zoom (not illustrated) and a motor for zoom (not illustrated). The zoom lens **98**C is mounted to the slide mechanism for zoom so as to be slidable along the optical axis OA. In addition, the motor for zoom is connected to the slide mechanism for zoom, and the slide mechanism for zoom operates by receiving the power of the motor for zoom to move the zoom lens **98**C along the optical axis OA.

(112) Here, although an example of the embodiment in which the slide mechanism for focus and the slide mechanism for zoom are separately provided is given, this is merely an example, and an integrated slide mechanism that can implement both focusing and zooming may be used. In addition, in this case, the power generated by one motor may be transmitted to the slide mechanism without using the motor for focus and the motor for zoom.

(113) The third actuator **108** comprises a power transmission mechanism (not illustrated) and a motor for stop (not illustrated). The stop **98**D has an opening **98**D**1** and is a stop in which the size of the opening **98**D**1** is variable. The opening **98**D**1** is formed by a plurality of stop leaf blades **98**D**2**. The plurality of stop leaf blades **98**D**2** are connected to the power transmission mechanism. In addition, the motor for stop is connected to the power transmission mechanism, and the power transmission mechanism transmits the power of the motor for stop to the plurality of stop leaf blades **98**D**2**. The plurality of stop leaf blades **98**D**2** receives the power that is transmitted from the power transmission mechanism and operates to change the size of the opening **98**D**1**. The stop **98**D adjusts the exposure by changing the size of the opening **98**D**1**.

(114) The motor for focus, the motor for zoom, and the motor for stop are connected to the control device **102**, and the control device **102** controls each drive of the motor for focus, the motor for zoom, and the motor for stop. A stepping motor is adopted as an example of the motor for focus, the motor for zoom, and the motor for stop in the present embodiment. Therefore, the motor for focus, the motor for zoom, and the motor for stop operate in synchronization with a pulse signal in response to a command from the control device **102**. In addition, although an example in which the motor for focus, the motor for zoom, and the motor for stop are provided in the interchangeable lens **90** has been described here, this is merely an example, and at least one of the motor for focus, the motor for zoom, or the motor for stop may be provided in the imaging apparatus main body **92**. A structure and/or an operation method of the interchangeable lens **90** can be changed as needed.

(115) The interchangeable lens **90** comprises a first sensor (not illustrated). The first sensor detects a position of the focus lens **98**B on the optical axis OA. An example of the first sensor is a potentiometer. A detection result from the first sensor is acquired by the control device **102** and is output to the imaging apparatus main body **92**. The imaging apparatus main body **92** adjusts the

position of the focus lens **98**B on the optical axis OA based on the detection result from the first sensor.

(116) The interchangeable lens **90** comprises a second sensor (not illustrated). The second sensor detects a position of the zoom lens **98**C on the optical axis OA. An example of the second sensor is a potentiometer. A detection result from the second sensor is acquired by the control device **102** and is output to the imaging apparatus main body **92**. The imaging apparatus main body **92** adjusts the position of the zoom lens **98**C on the optical axis OA based on the detection result from the second sensor.

(117) The interchangeable lens **90** comprises a third sensor (not illustrated). The third sensor detects a size of the opening **98**D**1**. An example of the third sensor is a potentiometer. The detection result from the third sensor is acquired by the control device **102** and is output to the imaging apparatus main body **92**. The imaging apparatus main body **92** adjusts the size of the opening **98**D**1** based on the detection result from the third sensor.

(118) In the imaging apparatus **34**, an MF mode and an AF mode are selectively set in accordance with the instruction given to the imaging apparatus main body **92**. The MF mode is an operation mode that focuses manually. In the MF mode, for example, by operating a focus ring (not illustrated) or the like by the user, the focus lens **98**B is moved along the optical axis OA with the movement amount according to the operation amount of the focus ring or the like, thereby the focus is adjusted.

(119) In the AF mode, the imaging apparatus main body **92** calculates a focusing position according to a subject distance and moves the focus lens **98**B toward the calculated focusing position to adjust the focus. Here, the focusing position refers to a position of the focus lens **98**B on the optical axis OA in an in-focus state. In the following, for convenience of explanation, the control of aligning the focus lens **98**B with the focusing position is also referred to as an "AF control".

(120) The imaging apparatus main body **92** comprises the image sensor **94**, a controller **110**, an image memory **112**, a UI-based device **114**, an external I/F **116**, a communication I/F **118**, a photoelectric conversion element driver **120**, a mechanical shutter driver **122**, a mechanical shutter actuator **124**, a mechanical shutter **126**, and an input/output interface **128**. In addition, the image sensor **94** comprises the photoelectric conversion element **96** and a signal processing circuit **130**.

(121) The controller **110**, the image memory **112**, the UI-based device **114**, the external I/F **116**, the communication I/F **118**, the photoelectric conversion element driver **120**, the mechanical shutter driver **122**, and the signal processing circuit **130** are connected to the input/output interface **128**. In addition, the control device **102** of the interchangeable lens **90** is also connected to the input/output interface **128**.

(122) The controller **110** comprises a processor **132**, a storage **134**, and a RAM **136**. The processor **132**, the storage **134**, and the RAM **136** are connected to each other via a bus **138**, and the bus **138** is connected to the input/output interface **128**.

(123) In the example illustrated in FIG. **4**, one bus is illustrated as the bus **138** for convenience of illustration, but a plurality of buses may be used. The bus **138** may be a serial bus or may be a parallel bus including a data bus, an address bus, a control bus, or the like.

(124) For example, the processor **132** has a CPU and a GPU and controls the entire imaging apparatus **34**. The GPU operates under the control of the CPU, and is responsible for performing the image processing.

(125) The storage **134** is a non-transitory storage medium, and stores various parameters and various programs. For example, the storage **134** is an EEPROM. However, this is merely an example, and an HDD and/or SSD or the like may be applied as the storage **134** instead of the EEPROM or together with the EEPROM. In addition, the RAM **136** transitorily stores various types of information, and is used as a work memory.

(126) The processor **132** reads out a necessary program from the storage **134** and executes the read

program on the RAM **136**. The processor **132** controls the entire imaging apparatus **34** in accordance with the program executed on the RAM **136**. In the example illustrated in FIG. **2**, the image memory **112**, the UI-based device **114**, the external I/F **116**, the communication I/F **118**, the photoelectric conversion element driver **120**, the mechanical shutter driver **122**, and the control device **102** are controlled by the processor **132**.

(127) The photoelectric conversion element driver **120** is connected to the photoelectric conversion element **96**. The photoelectric conversion element driver **120** supplies an imaging timing signal, which defines the timing of the imaging executed by the photoelectric conversion element **96**, to the photoelectric conversion element **96** in accordance with an instruction from the processor **132**. The photoelectric conversion element **96** executes reset, exposure, and output of an electric signal in accordance with the imaging timing signal supplied from the photoelectric conversion element driver **120**. Examples of the imaging timing signal include a vertical synchronization signal and a horizontal synchronization signal.

(128) In a case in which the interchangeable lens **90** is mounted to the imaging apparatus main body **92**, the subject light incident on the imaging lens **98** is imaged on the light-receiving surface **96**A by the imaging lens **98**. Under the control of the photoelectric conversion element driver **120**, the photoelectric conversion element **96** photoelectrically converts the subject light received by the light-receiving surface **96**A, and outputs the electric signal according to the light amount of the subject light to the signal processing circuit **130** as analog image data indicating the subject light. Specifically, the signal processing circuit **130** reads out the analog image data from the photoelectric conversion element **96** in one frame unit and for each horizontal line by an exposure sequential read-out method.

(129) The signal processing circuit **130** digitizes the analog image data to generate digital image data. In the following, for convenience of explanation, in a case in which it is not necessary to distinguish between digital image data to be internally processed in the imaging apparatus main body **92** and an image indicated by the digital image data (that is, an image that is visualized based on the digital image data and displayed on the display or the like), it is referred to as a "captured image **127**".

(130) The mechanical shutter **126** is a focal plane shutter and is disposed between the stop **98**D and the light-receiving surface **96**A. The mechanical shutter **126** comprises a front curtain (not illustrated) and a rear curtain (not illustrated). Each of the front curtain and the rear curtain comprises a plurality of leaf blades. The front curtain is disposed closer to the subject than the rear curtain.

(131) The mechanical shutter actuator **124** is an actuator having a link mechanism (not illustrated), a solenoid for a front curtain (not illustrated), and a solenoid for a rear curtain (not illustrated). The solenoid for a front curtain is a drive source of the front curtain and is mechanically connected to the front curtain via the link mechanism. The solenoid for a rear curtain is a drive source of the rear curtain and is mechanically connected to the rear curtain via the link mechanism. The mechanical shutter driver **122** controls the mechanical shutter actuator **124** in accordance with the instruction from the processor **132**.

(132) The solenoid for a front curtain generates power under the control of the mechanical shutter driver **122** and selectively executes winding up and pulling down the front curtain by applying the generated power to the front curtain. The solenoid for a rear curtain generates power under the control of the mechanical shutter driver **122** and selectively executes winding up and pulling down the rear curtain by applying the generated power to the rear curtain. In the imaging apparatus **34**, the exposure amount with respect to the photoelectric conversion element **96** is controlled by controlling the opening and closing of the front curtain and the opening and closing of the rear curtain by the processor **132**.

(133) In the imaging apparatus **34**, imaging for a live view image and imaging for a recorded image for recording a still image and/or a video are executed by using the expo sure sequential reading

method (rolling shutter method). The image sensor **94** has an electronic shutter function, and the imaging for a live view image is implemented by activating the electronic shutter function without operating the mechanical shutter **126** in a fully opened state.

(134) On the other hand, imaging accompanied by the main exposure, that is, the imaging for a still image (hereinafter, also referred to as a "main imaging") is implemented by activating the electronic shutter function and operating the mechanical shutter **126** such that the mechanical shutter **126** transitions from the front curtain closed state to the rear curtain closed state.

(135) The image memory **112** stores the captured image **127** generated by the signal processing circuit **130**. That is, the signal processing circuit **130** causes the image memory **112** to store the captured image **127**. The processor **132** acquires the captured image **127** from the image memory **112** and performs various types of processing by using the acquired captured image **127**.

(136) The UI-based device **114** comprises a display **140**, and the processor **132** causes the display **140** to display various types of information. In addition, the UI-based device **114** comprises a reception device **142**. The reception device **142** comprises a touch panel **144**, a release button **146**, and the like.

(137) The release button **146** functions as an imaging preparation instruction unit and an imaging instruction unit, and a push operation of two stages of an imaging preparation instruction state and an imaging instruction state can be detected. For example, the imaging preparation instruction state refers to a state in which the release button is pushed to an intermediate position (half push position) from a standby position, and the imaging instruction state refers to a state in which the release button is pushed to a final push position (full push position) beyond the intermediate position. In the following, the "state in which the release button is pushed to the half push position from the standby position" will be referred to as a "half push state", and the "state in which the release button is pushed to the full push position from the standby position" will be referred to as a "full push state".

(138) The external I/F **116** controls the exchange of various types of information with a device existing outside the imaging apparatus **34** (hereinafter, also referred to as an "external device"). Examples of the external I/F **116** include a USB interface. External devices (not illustrated), such as a 3D sensor **38** (refer to FIGS. **1** and **5**), a smart device, a personal computer, a server, a USB memory, a memory card, and/or a printer, are directly or indirectly connected to the USB interface.

(139) The communication I/F **118** controls transmission and reception of information by the imaging apparatus **34** with respect to the information processing apparatus **30**. As an example, as illustrated in FIG. **5**, the communication I/F **118** is connected to the information processing apparatus **30** in a communicable manner. Here, the communication I/F **118** is connected to the second communication I/F **54** of the information processing apparatus **30** so as to be capable of wireless communication by a predetermined wireless communication standard. Here, although wireless communication is illustrated, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The communication I/F **118** controls the exchange of the information between the processor **62** of the information processing apparatus **30** and the processor **132** of the imaging apparatus **34**. For example, the communication I/F **118** transmits the information in response to a request from the processor **132** to the information processing apparatus **30**. In addition, the communication I/F **118** receives the information transmitted from the processor **62** of the information processing apparatus **30** via the second communication I/F **54** to output the received information to the processor **132** via the bus **138**.

(140) The processor **132** operates the 3D sensor **38** in accordance with the instruction from the information processing apparatus **30** to cause the 3D sensor **38** to execute the distance measurement. That is, the processor **132** causes the 3D sensor **38** to measure the distance to the inspection object **16** (refer to FIG. **1**). A distance measurement range, that is, a range of the inspection object **16** measured by the 3D sensor **38** is a range corresponding to the imaging range

(for example, the imaging range for one frame) imaged by the imaging apparatus **34**. The processor **132** acquires a distance measurement result **150** obtained by the 3D sensor **38**. The distance measurement result **150** includes a distance image **148** as information based on the distance between the inspection object **16** and the imaging apparatus **34**. The distance image **148** is generated by the 3D sensor **38** based on the distance measurement results.

(141) The distance image **148** is an image illustrating a distance from the imaging apparatus **34** to a plurality of distance measurement points within the distance measurement range. In addition, the distance image **148** has a plurality of pixels arranged in a matrix, and each pixel is represented by a color according to a distance obtained by distance measurement. Distance data indicating a distance from the imaging apparatus **34** to a distance measurement point within the distance measurement range is assigned to the plurality of pixels, and the color according to the distance indicated by the distance data is applied to the plurality of pixels. The color according to the distance is a color within a constant hue angle (here, as an example, a hue angle of 0 degree or more and 240 degrees or less). For example, a color closer to blue is applied to the pixel as the distance indicated by the distance data applied to the pixels is farther from the imaging apparatus **34**, and a color closer to red is applied to the pixel as the distance indicated by the distance data applied to the pixels is closer to the imaging apparatus **34**.

(142) As an example, as illustrated in FIG. **6**, the biaxial revolution device **18** which is one of the drive systems **14** comprises a pan mechanism **40**, a tilt mechanism **42**, a controller **152**, and a communication I/F **154**.

(143) The controller **152** controls the entire biaxial revolution device **18**. An example of the controller **152** is a computer having a processor (for example, a CPU), a storage (for example, an EEPROM), and a RAM. The computer is merely an example, and a device including an ASIC, an FPGA, and/or a PLD may be applied instead of the computer. In addition, instead of the computer, a combination of a hardware configuration and a software configuration may be used.

(144) The communication I/F **154** is connected to the controller **152**. In addition, the communication I/F **154** is connected to the information processing apparatus **30** in a communicable manner. Here, the communication I/F **154** is connected to the third communication I/F **56** of the information processing apparatus **30** so as to be capable of wireless communication by a predetermined wireless communication standard. Here, although wireless communication is illustrated, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The communication I/F **154** controls the exchange of the information between the controller **152** of the biaxial revolution device **18** and the processor **62** of the information processing apparatus **30**. For example, the communication I/F **154** transmits the information in response to a request from the controller **152** to the information processing apparatus **30**. In addition, the communication I/F **154** receives the information transmitted from the processor **62** of the information processing apparatus **30** via the third communication I/F **56** to output the received information to the controller **152**.

(145) The pan mechanism **40** has a pan motor **40**A. The pan motor **40**A is connected to the controller **152**, and is driven under the control of the controller **152**. The pan mechanism **40** pans the imaging apparatus **34** by transmitting a driving force of the pan motor **40**A to the imaging apparatus **34** as power around the pan axis PA (refer to FIG. **1**).

(146) The tilt mechanism **42** has a tilt motor **42**A. The tilt motor **42**A is connected to the controller **152**, and is driven under the control of the controller **152**. The tilt mechanism **42** tilts the imaging apparatus **34** by transmitting a driving force of the tilt motor **42**A to the imaging apparatus **34** as power around the tilt axis TA (refer to FIG. **1**).

(147) As an example, as illustrated in FIG. **7**, the vehicle **20** which is one of the drive systems **14** comprises a controller **156**, a communication I/F **158**, a traveling motor **160**, and a power transmission mechanism **162**.

(148) The controller **156** controls the entire vehicle **20**. An example of the controller **156** is a

computer having a processor (for example, a CPU), a storage (for example, an EEPROM), and a RAM. The computer is merely an example, and a device including an ASIC, an FPGA, and/or a PLD may be applied instead of the computer. In addition, instead of the computer, a combination of a hardware configuration and a software configuration may be used.

(149) The communication I/F **158** is connected to the controller **156**. In addition, the communication I/F **158** is connected to the information processing apparatus **30** in a communicable manner. Here, the communication I/F **158** is connected to the fourth communication I/F **58** of the information processing apparatus **30** so as to be capable of wireless communication by a predetermined wireless communication standard. Here, although wireless communication is illustrated, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The communication I/F **158** controls the exchange of the information between the controller **156** of the vehicle **20** and the processor **62** of the information processing apparatus **30**. For example, the communication I/F **158** transmits the information in response to a request from the controller **156** to the information processing apparatus **30**. In addition, the communication I/F **158** receives the information transmitted from the processor **62** of the information processing apparatus **30** via the fourth communication I/F **58** to output the received information to the controller **156**.

(150) The traveling motor **160** is connected to the controller **156**, and is driven under the control of the controller **156**. The power transmission mechanism **162** is connected to the traveling motor **160** and a plurality of wheels **20**A (for example, two front wheels, two rear wheels, or four wheels **20**A). The power transmission mechanism **162** rotates the plurality of wheels **20**A by transmitting a driving force of the traveling motor **160** to the plurality of wheels **20**A. In a case in which the plurality of wheels **20**A rotate, the vehicle **20** travels. The vehicle **20** also comprises a direction changing mechanism (not illustrated) that changes the direction of the plurality of wheels **20**A and a direction changing motor (not illustrated) that applies power to the direction changing mechanism, and the power of the direction changing motor is controlled by the controller **156**. The information processing apparatus **30** controls the traveling of the vehicle **20** by controlling the drive of the traveling motor **160** and the direction change motor via the controller **156**.

(151) As an example, as illustrated in FIG. **8**, the lifting device **22** which is one of the drive systems **14** comprises a controller **164**, a communication I/F **166**, a lifting motor **168**, and a power transmission mechanism **170**.

(152) The controller **164** controls the entire lifting device **22**. An example of the controller **164** is a computer having a processor (for example, a CPU), a storage (for example, an EEPROM), and a RAM. The computer is merely an example, and a device including an ASIC, an FPGA, and/or a PLD may be applied instead of the computer. In addition, instead of the computer, a combination of a hardware configuration and a software configuration may be used.

(153) The communication I/F **166** is connected to the controller **164**. In addition, the communication I/F **166** is connected to the information processing apparatus **30** in a communicable manner. Here, the communication I/F **166** is connected to the fifth communication I/F **60** of the information processing apparatus **30** so as to be capable of wireless communication by a predetermined wireless communication standard. Here, although wireless communication is illustrated, the technology of the present disclosure is not limited to this, and wired communication may be applied instead of the wireless communication. The communication I/F **166** controls the exchange of the information between the controller **164** of the lifting device **22** and the processor **62** of the information processing apparatus **30**. For example, the communication I/F **166** transmits the information in response to a request from the controller **164** to the information processing apparatus **30**. In addition, the communication I/F **166** receives the information transmitted from the processor **62** of the information processing apparatus **30** via the fifth communication I/F **60** to output the received information to the controller **164**.

(154) The lifting motor **168** is connected to the controller **164**, and is driven under the control of

the controller **164**. The power transmission mechanism **170** is connected to the lifting motor **168** and the pantograph mechanism **28**. The power transmission mechanism **170** expands and contracts the pantograph mechanism **28** in the vertical direction by transmitting a driving force of the lifting motor **168** to the pantograph mechanism **28**. As the pantograph mechanism **28** expands and contracts along the vertical direction, raising and lowering of the gondola **26** (refer to FIG. **1**) is implemented.

(155) As an example, as illustrated in FIG. **9**, an inspection support processing program **172** is stored in the storage **64** of the information processing apparatus **30**. The inspection support processing program **172** is an example of a "program" according to the technology of the present disclosure.

(156) The processor **62** reads out the inspection support processing program **172** from the storage **64** and executes the read inspection support processing program **172** on the RAM **66**. The processor **62** performs inspection support processing in accordance with the inspection support processing program **172** executed on the RAM **66** (refer to FIGS. **45**A to **45**D). By executing the inspection support processing program **172**, the processor **62** operates as a reception unit **62**A, a determination unit **62**B, an imaging apparatus control unit **62**C, a screen generation unit **62**D, a calculation unit **62**E, a drive system control unit **62**F, an acquisition unit **62**G, a transmission unit **62**H, a composition unit **62**I, and a signal generation unit **62**J.

(157) As an example, as illustrated in FIG. **10**, an imaging apparatus side processing program **174** is stored in the storage **134** of the imaging apparatus **34**. The processor **132** reads out the imaging apparatus side processing program **174** from the storage **134** and executes the read imaging apparatus side processing program **174** on the RAM **136**. The processor **132** performs the imaging apparatus side processing in accordance with the imaging apparatus side processing program **174** executed on the RAM **136** (refer to FIG. **45**). By executing the imaging apparatus side processing program **174**, the processor **132** operates as a reception unit **132**A, an imaging system control unit **132**B, a distance measurement system control unit **132**C, and a transmission unit **132**D.

(158) As an example, as illustrated in FIG. **11**, a tablet side processing program **176** is stored in the storage **80** of the tablet terminal **32**. The processor **78** reads out the tablet side processing program **176** from the storage **80** and executes the read tablet side processing program **176** on the RAM **82**. The processor **78** performs the tablet side processing in accordance with the tablet side processing program **176** executed on the RAM **82** (refer to FIGS. **44**A to **44**C). By executing the tablet side processing program **176**, the processor **78** operates as a display control unit **78**A, a determination unit **78**B, a signal generation unit **78**C, a transmission unit **78**D, a reception unit **78**E, and an adjustment value calculation unit **78**F.

(159) In a case in which the tablet side processing is performed by the processor **78** in the tablet terminal **32**, as an example, as illustrated in FIG. **12**, a startup setting screen **178**, an imaging start screen **180**, an imaging condition adjustment screen **182**, a composition confirmation screen **184**, an imaging permission screen **186**, and a setting screen **188** are selectively displayed on the touch panel display **72** of the tablet terminal **32**.

(160) The startup setting screen **178** is first displayed on the touch panel display **72** by performing the tablet side processing. The startup setting screen **178** is a screen that allows the user **36** (refer to FIG. **1**) to select between performing the choke detection processing and performing the damage detection processing, allows the user **36** to designate the size of the damage or the like which is to be a detection target, or receives an instruction to start the imaging for the imaging apparatus **34**.

(161) The imaging start screen is a screen that receives an instruction to start imaging for a panoramic image used in the choke detection processing and/or the damage detection processing. The imaging condition adjustment screen **182** is a screen that receives an instruction to adjust imaging conditions of the imaging apparatus **34**. The imaging condition adjustment screen **182** is classified into a movement guidance screen **190**, a telescopic zoom guidance screen **192**, a wide angle zoom guidance screen **194**, and an inclination adjustment guidance screen **196**. The

movement guidance screen **190** is a screen that guides the user **36** regarding the adjustment of a movement direction of the imaging range of the imaging apparatus **34**. The telescopic zoom guidance screen **192** is a screen that guides the user **36** regarding the setting of the optical telescopic zoom of the imaging apparatus **34**. The wide angle zoom guidance screen **194** is a screen that guides the user **36** regarding the setting of the optical wide angle zoom of the imaging apparatus **34**. The inclination adjustment guidance screen **196** is a screen that guides the user **36** regarding the adjustment of the inclination of the captured image **127**.

(162) The composition confirmation screen **184** is a screen that allows the user **36** to confirm the panoramic image. The imaging permission screen **186** is a screen that notifies the user **36** that the main imaging is permitted and that receives an instruction to start the main imaging. The setting screen **188** is a screen that receives instructions of various settings (for example, a change from the choke detection processing to the damage detection processing, a change from the damage detection processing to the choke detection processing, and/or a change in the size of the damage or the like which is to be a detection target).

(163) In the following, an example of processing in which the startup setting screen **178**, the imaging start screen **180**, the imaging condition adjustment screen **182**, the composition confirmation screen **184**, the imaging permission screen **186**, and the setting screen **188** are generated by the information processing system **12** will be explained.

(164) As an example, as illustrated in FIG. **13**, in the tablet terminal **32**, the display control unit **78**A generates a startup setting screen **178**, and displays the generated startup setting screen **178** on the touch panel display **72**. In the startup setting screen **178**, a first button **178**A, a second button **178**B, a plurality of size designation boxes **178**C, and an imaging start key **178**D are displayed. The first button **178**A is a slide-type soft key, and on and off can be switched by sliding the first button **178**A. In a case in which the first button **178**A is turned on, the choke detection processing is performed, and in a case in which the first button **178**A is turned off, the choke detection processing is not performed. The second button **178**B is a slide-type soft key. In a case in which the second button **178**B is turned on, the damage detection processing is performed, and in a case in which the second button **178**B is turned off, the damage detection processing is not performed. The plurality of size designation boxes **178**C are used to designate the size of the damage or the like which is to be a detection target. In the plurality of size designation boxes **178**C, ranges of different sizes as the size of the damage or the like which is to be a detection target, and radio buttons are displayed. In a case in which any of the radio buttons of the plurality of size designation boxes **178**C is turned on, damage or the like in a size range displayed in the size designation box **178**C to which the radio button is turned on is set as a detection target. The imaging start key **178**D receives an instruction to start imaging by the imaging apparatus **34**. In a case in which the imaging start key **178**D is turned on, an instruction to start imaging by the imaging apparatus **34** is received.

(165) The determination unit **78**B determines whether or not the imaging start key **178**D has been turned on. As an example, as illustrated in FIG. **14**, in a case in which the imaging start key **178**D is turned on, the signal generation unit **78**C generates a live view imaging instruction signal and generates a distance measurement instruction signal. The live view imaging instruction signal is a signal instructing the imaging apparatus **34** to start imaging for a live view image, and the distance measurement instruction signal is a signal instructing the imaging apparatus **34** to start the distance measurement, that is, a signal instructing the imaging apparatus **34** to acquire the distance measurement result. The transmission unit **78**D transmits the live view imaging instruction signal and the distance measurement instruction signal, which are generated by the signal generation unit **78**C, to the information processing apparatus **30**.

(166) As an example, as illustrated in FIG. **15**, in the information processing apparatus **30**, the reception unit **62**A receives the distance measurement instruction signal transmitted from the transmission unit **78**D of the tablet terminal **32**. The determination unit **62**B determines whether or not the signal received by the reception unit **62**A is the distance measurement instruction signal. In

a case in which the determination unit **62**B determines that the signal received by the reception unit **62**A is the distance measurement instruction signal, the imaging apparatus control unit **62**C transmits the distance measurement instruction signal received by the reception unit **62**A to the imaging apparatus **34**.

(167) In the imaging apparatus **34**, the reception unit **132**A receives the distance measurement instruction signal which is transmitted by the imaging apparatus control unit **62**C of the information processing apparatus **30**. In a case in which the distance measurement instruction signal is received by the reception unit **132**A, the distance measurement system control unit **132**C causes the 3D sensor **38** (refer to FIG. **5**) to execute the distance measurement.

(168) As an example, as illustrated in FIG. **16**, in the imaging apparatus **34**, the distance measurement system control unit **132**C causes the 3D sensor **38** to execute the distance measurement to generate a distance image **148** (refer to FIG. **5**), and acquires the distance measurement result **150** including the distance image **148** from the 3D sensor **38**. The transmission unit **132**D transmits the distance measurement result **150** including the distance image **148** to the information processing apparatus **30**.

(169) In the information processing apparatus **30**, the reception unit **62**A receives the distance measurement result **150** which is transmitted from the transmission unit **132**D of the imaging apparatus **34**. The determination unit **62**B determines whether or not the signal received by the reception unit **62**A is the distance measurement result. In a case in which the determination unit **62**B determines that the signal received by the reception unit **62**A is the distance measurement result **150**, the acquisition unit **62**G acquires the distance measurement result **150** received by the reception unit **62**A and overwrites and stores the acquired distance measurement result **150** in a distance measurement result storage region of the RAM **66**.

(170) As an example, as illustrated in FIG. **17**, in the information processing apparatus **30**, the reception unit **62**A receives the live view imaging instruction signal transmitted from the transmission unit **78**D of the tablet terminal **32**. The determination unit **62**B determines whether or not the signal received by the reception unit **62**A is the live view imaging instruction signal. In a case in which the determination unit **62**B determines that the signal received by the reception unit **62**A is the live view imaging instruction signal, the imaging apparatus control unit **62**C transmits the live view imaging instruction signal received by the reception unit **62**A to the imaging apparatus **34**.

(171) In the imaging apparatus **34**, the reception unit **132**A receives the live view imaging instruction signal transmitted by the imaging apparatus control unit **62**C of the information processing apparatus **30**. In a case in which the live view imaging instruction signal is received by the reception unit **132**A, the imaging system control unit **132**B executes the imaging for a live view image.

(172) As an example, as illustrated in FIG. **18**, in the imaging apparatus **34**, the imaging system control unit **132**B acquires a live view image **198** as the captured image **127** (refer to FIG. **4**) by executing the imaging for a live view image with the inspection object **16** (refer to FIG. **1**) as a subject. The transmission unit **132**D transmits the live view image **198** which is acquired by the imaging system control unit **132**B to the information processing apparatus **30**.

(173) In the information processing apparatus **30**, the reception unit **62**A receives the live view image **198** which is transmitted from the transmission unit **132**D of the imaging apparatus **34**. The determination unit **62**B determines whether or not the live view image **198** has been received by the reception unit **62**A. In a case in which the determination unit **62**B determines that the live view image **198** has been received by the reception unit **62**A, the acquisition unit **62**G acquires the live view image **198** which is received by the reception unit **62**A and overwrites and stores the acquired live view image **198** in the live view image storage region of the RAM **66**.

(174) In the storage **64**, a pre-captured image **202** is stored. The pre-captured image **202** is an image based on a still image **206** obtained by executing the main imaging by the imaging apparatus

34. For example, the pre-captured image **202** is a composite image **204** or the still image **206** for one frame. The still image **206** is an example of a "main-captured image" according to the technology of the present disclosure.

(175) The composite image **204** is an image illustrating a scene wider than the imaging scene illustrated by the live view image **198**. For example, in a case in which each of a plurality of still images **206** obtained by executing the main imaging by the imaging apparatus **34** is obtained by the main imaging of the imaging scene illustrated by the live view image **198**, the composite image **204** is an image obtained by combining the plurality of still images **206** (that is, a panoramic image).

(176) Here, for convenience of explanation, the explanation is made on the premise that the pre-captured image **202** is stored in the storage **64**, there may be a case in which the pre-captured image **202** is not stored in the storage **64**. In this case, the still image **206** for one frame, which is obtained by executing the main imaging by the imaging apparatus **34**, is stored in the storage **64**.

(177) The screen generation unit **62**D generates imaging start screen data **200** based on the live view image **198** acquired by the acquisition unit **62**G and the pre-captured image **202** stored in the storage **64**. The imaging start screen data **200** is screen data for displaying the imaging start screen **180** (refer to FIG. **12**, FIGS. **19** and **20**) on the touch panel display **72** (for example, screen data indicating the imaging start screen **180** (refer to FIG. **12**, FIGS. **19** and **20**)). The transmission unit **62**H transmits the imaging start screen data **200**, which is generated by the screen generation unit **62**D, to the tablet terminal **32**.

(178) Here, the imaging start screen data **200** is an example of "screen data" according to the technology of the present disclosure. In addition, the transmission of the imaging start screen data **200** by the transmission unit **62**H is an example of "output" of the "screen data" according to the technology of the present disclosure. In addition, the touch panel display **72** is an example of a "first display" and a "second display" according to the technology of the present disclosure.

(179) As an example, as illustrated in FIGS. **19** and **20**, the imaging start screen **180** includes a screen frame **180**A, a live view region **180**B, a guide view region **180**C, a wide view region **180**D, a guide region **180**E, and an instruction reception region **180**F.

(180) The screen frame **180**A is a screen frame of common specifications among the imaging start screen **180**, the imaging condition adjustment screen **182**, the composition confirmation screen **184**, and the imaging permission screen **186**. On an upper end portion of the screen frame **180**A, setting button **208**, an imaging mode change button **210**, a reference button **212**, and an imaging end key **214** are displayed.

(181) The setting button **208** is a button that receives an instruction to switch the screen currently displayed on the touch panel display **72** to the setting screen **188** (refer to FIG. **12**). In a case in which the setting button **208** is turned on, the screen currently displayed on the touch panel display **72** (the imaging start screen **180** in the example illustrated in FIG. **19**) is switched to the setting screen **188**. The imaging mode change button **210** is a slide-type soft key, and is used to switch between on and off modes by sliding the imaging mode change button **210**. In a case in which the imaging mode change button **210** is turned on, the AF mode is set as the imaging mode of the imaging apparatus **34**, and in a case where the imaging mode change button **210** is turned off, the MF mode is set as the imaging mode of the imaging apparatus **34**. The reference button **212** is a button that receives an instruction to display information (hereinafter, referred to as "reference information") which is predetermined as information to be referred to by the user **36**. In a case in which the reference button **212** is turned on, reference information is displayed on the touch panel display **72**. The imaging end key **214** is a soft key that receives an instruction to end the imaging for a live view image. In a case in which the imaging end key **214** is turned on, the imaging for a live view image by the imaging apparatus **34** is stopped.

(182) The live view region **180**B is superimposed on a region of the screen frame **180**A other than the upper end portion. In the live view region **180**B, the live view image **198** is displayed. The

instruction reception region **180**F is superimposed on the central portion of the live view region **180**B. The instruction reception region **180**F is a circular region. Any mark may be used as long as it is a mark that can visually identify the instruction reception region **180**F. Here, the instruction reception region **180**F in a circular region is exemplified, but this is merely an example, and the shape of the instruction reception region **180**F may be a shape other than a circle (for example, a diamond shape or a triangle shape). The instruction reception region **180**F has a function as a soft key, and receives an instruction to start imaging for a panoramic image used in the choke detection processing and/or the damage detection processing (hereinafter, also referred to as "imaging start instruction for a panoramic image"). The reception of the imaging start instruction for a panoramic image by the instruction reception region **180**F is implemented by tapping the instruction reception region **180**F.

(183) The guide view region **180**C is superimposed on a front view lower left portion of the live view region **180**B. The guide view region **180**C includes the wide view region **180**D and the guide region **180**E. The wide view region **180**D is superimposed on the guide view region **180**C within a range inside the outer frame of the guide view region **180**C. In the wide view region **180**D, the pre-captured image **202** (composite image **204** in the example illustrated in FIG. **19**) is displayed. The guide region **180**E is a region that has a smaller display area than the wide view region **180**D and is movable within the range inside the outer frame of the guide view region **180**C. In the guide view region **180**C, the guide region **180**E is superimposed on the guide view region **180**C, and in the wide view region **180**D, it is superimposed on the wide view region **180**D.

(184) The movement of the guide region **180**E within the guide view region **180**C is implemented, for example, by swiping or flicking by the user on the touch panel display **72**. In the guide region **180**E, the live view image **198** is displayed. The guide region **180**E is in a similar relationship with the live view region **180**B. In the guide region **180**E, the entire live view image **198** displayed in the live view region **180**B is displayed in a reduced state.

(185) In the guide region **180**E, an outer edge **180**E1 of the guide region **180**E is highlighted so that an image region corresponding to the live view image **198** displayed in the live view region **180**B can be specified within the wide view region **180**D. That is, the outer edge **180**E1 is highlighted so that a boundary between the guide region **180**E and the other region is visually distinguishable. The outer edge **180**E1 is an example of "guide information" according to the technology of the present disclosure.

(186) As an example, as illustrated in FIG. **21**, in the tablet terminal **32**, the reception unit **78**E receives the imaging start screen data **200** transmitted from the transmission unit **62**H of the information processing apparatus **30**. The determination unit **78**B determines whether or not the imaging start screen data **200** has been received by the reception unit **78**E. In a case in which the imaging start screen data **200** is received by the reception unit **78**E, the display control unit **78**A displays the imaging start screen **180** indicated by the imaging start screen data **200** received by the reception unit **78**E on the touch panel display **72**.

(187) As an example, as illustrated in FIG. **22**, in the tablet terminal **32**, the determination unit **78**B determines whether or not the instruction reception region **180**F within the imaging start screen **180** displayed on the touch panel display **72** is tapped by the user **36**. In a case in which the determination unit **78**B determines that the instruction reception region **180**F has been tapped by the user **36**, the signal generation unit **78**C generates an imaging condition confirmation signal. The imaging condition confirmation signal is a signal instructing the information processing apparatus **30** to confirm the imaging condition for generating the composite image **204**. The transmission unit **78**D transmits the imaging condition confirmation signal, which is generated by the signal generation unit **78**C, to the information processing apparatus **30**.

(188) As an example, as illustrated in FIG. **23**, in the information processing apparatus **30**, the reception unit **62**A receives the imaging condition confirmation signal transmitted from the transmission unit **78**D of the tablet terminal **32**. The determination unit **62**B determines whether or

not the signal received by the reception unit **62**A is the imaging condition confirmation signal. In a case in which the determination unit **62**B determines that the signal received by the reception unit **62**A is the imaging condition confirmation signal, the acquisition unit **62**G acquires the pre-captured image **202** from the storage **64** and acquires the live view image **198** and the distance measurement result **150** from the RAM **66**. The calculation unit **62**E calculates an overlap ratio, a zoom magnification, and an inclined angle. The overlap ratio refers to a ratio of an area of an overlap region **216** to an area of the live view image **198**.

(189) The overlap region **216** refers to a region where the live view image **198** and the pre-captured image **202** overlap each other. Here, although an example in which the live view image **198** and the pre-captured image **202** overlap each other is explained, the still image **206** obtained by executing the main imaging by the imaging apparatus **34** and the pre-captured image **202** may overlap each other.

(190) The zoom magnification refers to an optical zoom magnification required to match the size of the live view image **198** with the size of the still image **206** (refer to FIG. **18**) for one frame constituting the pre-captured image **202**.

(191) The inclined angle refers to an angle formed by an imaging target surface included in the inspection object **16** (refer to FIG. **1**) and the light-receiving surface **96**A (refer to FIG. **4**). The angle formed by the imaging target surface and the light-receiving surface **96**A is, for example, an angle formed by a normal vector of the imaging target surface and a normal vector of the light-receiving surface **96**A. The imaging target surface refers to, for example, a plane included in a central portion (for example, a central portion occupying several tens of percent of the imaging range) of the imaging range with respect to the inspection object **16**. The imaging target surface is specified, for example, from a region **148**A corresponding to the central portion of the imaging range with respect to the inspection object **16** in the distance image **148** included in the distance measurement result **150**. For example, the widest plane included as an image in the region **148**A is the imaging target surface. Here, the imaging target surface is an example of a "first imaging target surface" and a "second imaging target surface" according to the technology of the present disclosure. The light-receiving surface **96**A is an example of a "predetermined surface included in the imaging apparatus" and a "surface corresponding to an imaging surface of the image sensor" according to the technology of the present disclosure.

(192) As an example, as illustrated in FIG. **24**, in the information processing apparatus **30**, the determination unit **62**B determines whether or not the overlap ratio calculated by the calculation unit **62**E illustrated in FIG. **23** is outside a predetermined range. The predetermined range refers to, for example, a range within 30%±several % (that is, a tolerance). In a case in which the determination unit **62**B determines that the overlap ratio is outside the predetermined range, the calculation unit **62**E calculates that, as the movement direction and the movement amount of the imaging range, the movement direction and the movement amount necessary for the overlap ratio to be within the predetermined range.

(193) The screen generation unit **62**D generates movement guidance screen data **218** based on the movement direction and the movement amount calculated by the calculation unit **62**E. The movement guidance screen data **218** is screen data (for example, screen data indicating the movement guidance screen **190**) for displaying the movement guidance screen **190** (refer to FIGS. **12** and **25**) on the touch panel display **72**. The transmission unit **62**H transmits the movement guidance screen data **218**, which is generated by the screen generation unit **62**D, to the tablet terminal **32**.

(194) As an example, as illustrated in FIG. **25**, the movement guidance screen **190** indicated by the movement guidance screen data **218** is different from the imaging start screen **180** (refer to FIG. **19**) in that the instruction reception region **190**A is applied instead of the instruction reception region **180**F.

(195) The instruction reception region **190**A is a rhombus-shaped region, in which wedge-shaped

marks **190**A**1** to **190**A**4** indicating each of the four directions of up, down, left, and right are assigned to the four corners of the rhombus. In addition, a message that urges the user **36** to move the imaging range is displayed in the instruction reception region **190**A. In the example illustrated in FIG. **25**, the message "Please move" is illustrated. In a case of moving the imaging range in an upward direction, the mark **190**A**1** is tapped, in a case of moving the imaging range in a downward direction, the mark **190**A**2** is tapped, in a case of moving the imaging range in a leftward direction, the mark **190**A**3** is tapped, and in a case of moving the imaging range in a rightward direction, the mark **190**A**4** is tapped. A unit movement amount (for example, a movement amount for one tap) is, for example, 0.01 mm. In addition, the movement amount of the imaging range is determined, for example, according to the number of times of taps or the duration of a long press on the marks **190**A**1** to **190**A**4**. The unit movement amount may be a fixed value or a variable value that is changed according to a given instruction and/or various conditions.

(196) As an example, as illustrated in FIG. **26**, in the tablet terminal **32**, the reception unit **78**E receives the movement guidance screen data **218** transmitted from the transmission unit **62**H of the information processing apparatus **30**. The determination unit **78**B determines whether or not the movement guidance screen data **218** has been received by the reception unit **78**E. In a case in which the determination unit **78**B determines that the movement guidance screen data **218** has been received by the reception unit **78**E, the display control unit **78**A displays the movement guidance screen **190** indicated by the movement guidance screen data **218** received by the reception unit **78**E on the touch panel display **72**. In the example illustrated in FIG. **26**, an aspect in which the mark **190**A**4** within the movement guidance screen **190** is tapped by the user **36** is illustrated. In this case, the imaging range moves by the movement amount according to the number of times it is tapped in the leftward direction. In a case in which the position of the imaging range reaches a predetermined position (for example, a position where the overlap ratio falls within the predetermined range), the display control unit **78**A may delete the message within the instruction reception region **190**A.

(197) As an example, as illustrated in FIG. **27**, in the information processing apparatus **30**, the determination unit **62**B determines whether or not the zoom magnification calculated by the calculation unit **62**E illustrated in FIG. **23** needs to be changed. For example, in a case in which the zoom magnification is a value other than "1", it is determined that the zoom magnification needs to be changed. In a case in which the determination unit **62**B determines that the zoom magnification needs to be changed, the calculation unit **62**E calculates an insufficient zoom magnification. The insufficient zoom magnification refers to a zoom magnification that is insufficient to make the zoom magnification "1".

(198) The screen generation unit **62**D generates zoom guidance screen data **220** based on the insufficient zoom magnification calculated by the calculation unit **62**E. The zoom guidance screen data **220** is screen data for displaying the telescopic zoom guidance screen **192** (refer to FIGS. **12** and **28**) or the wide angle zoom guidance screen **194** (refer to FIGS. **12** and **29**) on the touch panel display **72** (for example, screen data indicating the telescopic zoom guidance screen **192** or the wide angle zoom guidance screen **194**). The transmission unit **62**H transmits the zoom guidance screen data **220**, which is generated by the screen generation unit **62**D, to the tablet terminal **32**. In the following, for convenience of explanation, in a case in which it is not necessary to explain the telescopic zoom guidance screen **192** and the wide angle zoom guidance screen **194** distinctively, they are referred to as the "zoom guidance screen" without a reference numeral.

(199) As an example, as illustrated in FIG. **28**, the telescopic zoom guidance screen **192** is different from the movement guidance screen **190** in that the instruction reception region **192**A is applied instead of the instruction reception region **190**A and that a reference frame **192**B is provided.

(200) The instruction reception region **192**A is a region that is in a similar relationship with the imaging range and has a quadrangular outer frame. In the instruction reception region **192**A, a message that urges the user **36** to operate the telescopic zoom is displayed. In the example

illustrated in FIG. **28**, the message "Please come closer" is displayed. In addition, in the telescopic zoom guidance screen **192**, the reference frame **192**B is assigned to the instruction reception region **192**A. The reference frame **192**B is a frame that is in a similar relationship with the instruction reception region **192**A and is larger than the instruction reception region **192**A. The reference frame **192**B is a frame of a size corresponding to the imaging range obtained by compensating for the insufficient zoom magnification.

(201) As an example, as illustrated in FIG. **29**, the wide angle zoom guidance screen **194** is different from the telescopic zoom guidance screen **192** in that the instruction reception region **194**A is applied instead of the instruction reception region **192**A and that a reference frame **194**B is applied instead of the reference frame **192**B.

(202) The instruction reception region **194**A is a region that is in a similar relationship with the imaging range and has a quadrangular outer frame. In the instruction reception region **194**A, a message that urges the user **36** to operate the wide angle zoom is displayed. In the example illustrated in FIG. **29**, the message "Please step back" is displayed. In addition, in the wide angle zoom guidance screen **194**, the reference frame **194**B is assigned to the instruction reception region **194**A. The reference frame **194**B is a frame that is in a similar relationship with the instruction reception region **194**A and is smaller than the instruction reception region **194**A. The reference frame **194**B is a frame of a size corresponding to the imaging range obtained by compensating for the insufficient zoom magnification.

(203) As an example, as illustrated in FIG. **30**, in the tablet terminal **32**, the reception unit **78**E receives the zoom guidance screen data **220** transmitted from the transmission unit **62**H of the information processing apparatus **30**. The determination unit **78**B determines whether or not the zoom guidance screen data **220** has been received by the reception unit **78**E. In a case in which the determination unit **78**B determines that the zoom guidance screen data **220** has been received by the reception unit **78**E, the display control unit **78**A displays the zoom guidance screen indicated by the zoom guidance screen data **220** received by the reception unit **78**E on the touch panel display **72**.

(204) In the example illustrated in FIG. **30**, an aspect in which the user **36** performs a pinch-out operation on the touch panel display **72** as an operation of adjusting the size of the instruction reception region **192**A in the telescopic zoom guidance screen **192** to the size of the reference frame **192**B is illustrated. The size of the instruction reception region **192**A gradually increases by the pinch-out operation, and eventually matches the size of the reference frame **192**B. In a case in which the size of the instruction reception region **192**A matches the size of the reference frame **192**B, the display control unit **78**A may delete the message in the instruction reception region **192**A, or may perform peaking processing on the instruction reception region **192**A.

(205) In the example illustrated in FIG. **30**, an aspect in which the user **36** performs a pinch-in operation on the touch panel display **72** as an operation of adjusting the size of the instruction reception region **194**A in the wide angle zoom guidance screen **194** to the size of the reference frame **194**B is illustrated. The size of the instruction reception region **194**A gradually increases by the pinch-in operation, and eventually matches the size of the reference frame **194**B. In a case in which the size of the instruction reception region **194**A matches the size of the reference frame **194**B, the display control unit **78**A may delete the message in the instruction reception region **194**A, or may perform peaking processing on the instruction reception region **194**A.

(206) As an example, as illustrated in FIG. **31**, in the information processing apparatus **30**, the determination unit **62**B determines whether or not the inclined angle calculated by the calculation unit **62**E illustrated in FIG. **23** is an angle other than a facing angle. The facing angle, for example, is determined by whether or not an angle with the light-receiving surface **96**A (refer to FIG. **4**) is larger than 0 degrees±one-hundredth of a degree (that is, a tolerance). In a case in which the determination unit **62**B determines that the inclined angle is an angle other than the facing angle, the calculation unit **62**E calculates a difference angle. The difference angle refers to an angle of

difference between the inclined angle and the facing angle. The difference angle is an example of "information indicating whether or not a second imaging target surface imaged by the imaging apparatus and the imaging apparatus face each other" according to the technology of the present disclosure.

(207) The screen generation unit **62**D generates the inclination adjustment guidance screen data **222** based on the difference angle calculated by the calculation unit **62**E. The inclination adjustment guidance screen data **222** is screen data (for example, screen data indicating the inclination adjustment guidance screen **196**) for displaying the inclination adjustment guidance screen **196** (refer to FIGS. **12** and **32**) on the touch panel display **72**. The transmission unit **62**H transmits the inclination adjustment guidance screen data **222**, which is generated by the screen generation unit **62**D, to the tablet terminal **32**.

(208) As an example, as illustrated in FIG. **32**, the inclination adjustment guidance screen **196** is different from the wide angle zoom guidance screen **194** in that the instruction reception region **196**A is applied instead of the instruction reception region **194**A and that a reference frame **196**B is applied instead of the reference frame **194**B.

(209) The instruction reception region **196**A is a region that is in a similar relationship with the imaging range and has a quadrangular outer frame. A message that urges the user **36** to perform an operation of adjusting the inclination of the imaging range is displayed in the instruction reception region **196**A. In the example illustrated in FIG. **32**, the message "Please adjust inclination" is displayed. In addition, in the inclination adjustment guidance screen **196**, the reference frame **196**B is assigned to the instruction reception region **196**A. The reference frame **196**B is a frame having a shape and a size corresponding to the imaging range, which is obtained by compensating for the difference angle.

(210) As an example, as illustrated in FIG. **33**, in the tablet terminal **32**, the reception unit **78**E receives the inclination adjustment guidance screen data **222** transmitted from the transmission unit **62**H of the information processing apparatus **30**. The determination unit **78**B determines whether or not the inclination adjustment guidance screen data **222** has been received by the reception unit **78**E. In a case in which the determination unit **78**B determines that the inclination adjustment guidance screen data **222** has been received by the reception unit **78**E, the display control unit **78**A displays the inclination adjustment guidance screen **196** indicated by the inclination adjustment guidance screen data **222** received by the reception unit **78**E on the touch panel display **72**.

(211) In the example illustrated in FIG. **33**, an aspect in which the user **36** performs a pinch-in operation and/or a pinch-out operation with respect to the touch panel display **72** as an operation of adjusting the shape and the size of the instruction reception region **196**A in the inclination adjustment guidance screen **196** to the shape and the size of the reference frame **196**B is illustrated. The shape and the size of the instruction reception region **196**A are changed by the pinch-in operation and/or the pinch-out operation, and eventually match the shape and the size of the reference frame **192**B. In a case in which the shape and the size of the instruction reception region **196**A matches the shape and the size of the reference frame **192**B, the display control unit **78**A may delete the message in the instruction reception region **196**A, or may perform peaking processing on the instruction reception region **196**A.

(212) As an example, as shown in FIG. **34**, in a case in which an adjustment instruction is given to the imaging condition adjustment screen **182** via the touch panel display **72** in the tablet terminal **32**, the adjustment value calculation unit **78**F calculates an adjustment value according to the adjustment instruction. Here, the adjustment instruction refers to an operation (for example, the tap) by the user **36** on the instruction reception region **190**A in the movement guidance screen **190** illustrated in FIG. **26** as an example, an operation (for example, a pinch-in operation and/or a pinch-out operation) by the user **36** on the instruction reception region **192**A or **194**A in the zoom guidance screen illustrated in FIG. **30** as an example, and/or an operation (for example, a pinch-in operation and/or a pinch-out operation) by the user **36** on the instruction reception region **196**A in

the inclination adjustment guidance screen **196** illustrated in FIG. **33** as an example.

(213) The signal generation unit **78**C generates the adjustment result signal indicating the adjustment value calculated by the adjustment value calculation unit **78**F. The transmission unit **78**D transmits the adjustment result signal, which is generated by the signal generation unit **78**C, to the information processing apparatus **30**.

(214) As an example, as illustrated in FIG. **35**, in the information processing apparatus **30**, the reception unit **62**A receives the adjustment result signal transmitted from the transmission unit **78**D of the tablet terminal **32**. The determination unit **62**B determines whether or not the adjustment result signal has been received by the reception unit **62**A. In a case in which the determination unit **62**B determines that the adjustment result signal has been received by the reception unit **62**A, the imaging apparatus control unit **62**C controls the imaging apparatus **34** in accordance with the adjustment result signal received by the reception unit **62**A, and the drive system control unit **62**F controls the drive system **14** in accordance with the adjustment result signal received by the reception unit **62**A.

(215) For example, in a case in which the adjustment value indicated by the adjustment result signal received by the reception unit **62**A is the adjustment value determined according to the adjustment instruction for the instruction reception region **192**A or **194**A (refer to FIG. **30**), the imaging apparatus control unit **62**C moves the zoom lens **98**C (refer to FIG. **4**) along the optical axis OA so as to compensate for the insufficient zoom magnification. After moving the zoom lens **98**C in this way, the zoom magnification is calculated again by the calculation unit **62**E (refer to FIG. **23**).

(216) In addition, for example, in a case in which the adjustment value indicated by the adjustment result signal received by the reception unit **62**A is the adjustment value determined according to the adjustment instruction for the instruction reception region **190**A (refer to FIG. **26**), the drive system control unit **62**F causes the vehicle **20** to travel in the imaging range in the movement direction and the movement amount according to the adjustment value or operates the lifting device **22**. After operating the vehicle **20** and/or the lifting device **22** in this way, the overlap ratio is calculated again by the calculation unit **62**E (refer to FIG. **23**).

(217) In addition, for example, in a case in which the adjustment value indicated by the adjustment result signal received by the reception unit **62**A is the adjustment value determined according to the adjustment instruction for the instruction reception region **196**A (refer to FIG. **33**), the drive system control unit **62**F operates the biaxial revolution device **18** so as to eliminate the difference angle. After operating the biaxial revolution device **18** in this way, the inclined angle is calculated again by the calculation unit **62**E (refer to FIG. **23**).

(218) As an example, as illustrated in FIG. **36**, in the information processing apparatus **30**, the determination unit **62**B determines whether or not the overlap ratio calculated by the calculation unit **62**E is within a predetermined range, the change of the zoom magnification calculated by the calculation unit **62**E is not necessary (for example, the zoom magnification=1), and the inclined angle calculated by the calculation unit **62**E is the facing angle. In a case in which the determination unit **62**B determines that the overlap ratio calculated by the calculation unit **62**E is within the predetermined range, the change of the zoom magnification calculated by the calculation unit **62**E is not necessary, and the inclined angle calculated by the calculation unit **62**E is the facing angle, the signal generation unit **62**J sets an imageable signal indicating that it is determined that the main imaging is executable. That is, the signal generation unit **62**J generates the imageable signal and stores the imageable signal in the RAM **66**.

(219) As an example, as illustrated in FIG. **37**, in the information processing apparatus **30**, the screen generation unit **62**D generates imaging permission screen data **224** in a case in which the imageable signal is set by the signal generation unit **62**J, that is, in a case in which the imageable signal is stored in the RAM **66**. The imaging permission screen data **224** is screen data (for example, screen data indicating the imaging permission screen **186**) for displaying the imaging

permission screen **186** (refer to FIGS. **12** and **38**) on the touch panel display **72**. The transmission unit **62**H transmits the imaging permission screen data **224** generated by the screen generation unit **62**D to the tablet terminal **32**, and erases the imageable signal in the RAM **66**. The imaging permission screen data **224** is an example of "data in which the screen includes an imaging instruction reception region of a display aspect for notifying that the main imaging is executable" according to the technology of the present disclosure.

(220) As an example, as illustrated in FIG. **38**, the imaging instruction reception region **186**A includes an imaging instruction reception region **186**A as a region of a display aspect for notifying that the main imaging is executable. The imaging permission screen **186** is different from the imaging start screen **180** in that the imaging instruction reception region **186**A is applied instead of the instruction reception region **180**F. The imaging instruction reception region **186**A is different from the instruction reception region **180**F in that it includes a message indicating that the main imaging is executable (in the example illustrated in FIG. **38**, a message of "Imaging OK"). The message indicating that the main imaging is executable is not essential, and the message indicating that the main imaging is executable may or may not be present.

(221) As an example, as illustrated in FIG. **39**, in the tablet terminal **32**, the reception unit **78**E receives the imaging permission screen data **224** transmitted from the transmission unit **62**H of the information processing apparatus **30**. The determination unit **78**B determines whether or not the imaging permission screen data **224** has been received by the reception unit **78**E. In a case in which the determination unit **78**B determines that the imaging permission screen data **224** has been received by the reception unit **78**E, the display control unit **78**A displays the imaging permission screen **186** indicated by the imaging permission screen data **224** received by the reception unit **78**E on the touch panel display **72**.

(222) As an example, as illustrated in FIG. **40**, in the tablet terminal **32**, the determination unit **78**B determines whether or not the imaging instruction reception region **186**A within the imaging permission screen **186** displayed on the touch panel display **72** is tapped by the user **36**. The tap by the user **36** on the imaging instruction reception region **186**A is an example of an "imaging instruction" according to the technology of the present disclosure.

(223) In a case in which an instruction from the user **36** is received by the imaging instruction reception region **186**A, that is, in a case in which the determination unit **78**B determines that the imaging instruction reception region **186**A has been tapped by the user **36**, the signal generation unit **78**C generates the main imaging instruction signal. The main imaging instruction signal is a signal indicating an instruction to cause the imaging apparatus **34** to execute the main imaging on the inspection object **16** (refer to FIG. **1**) indicated by the live view image **198**. The transmission unit **78**D transmits the main imaging instruction signal, which is generated by the signal generation unit **78**C, to the information processing apparatus **30**.

(224) As an example, as illustrated in FIG. **41**, in the information processing apparatus **30**, the reception unit **62**A receives the main imaging instruction signal transmitted from the transmission unit **78**D of the tablet terminal **32**. The determination unit **62**B determines whether or not the main imaging instruction signal has been received by the reception unit **62**A. In a case in which the determination unit **62**B determines that the main imaging instruction signal has been received by the reception unit **62**A, the imaging apparatus control unit **62**C transmits the main imaging instruction signal received by the reception unit **62**A to the imaging apparatus **34**. Here, the transmission of the main imaging instruction signal is an example of the "output" of the "main imaging instruction signal" according to the technology of the present disclosure.

(225) In the imaging apparatus **34**, the reception unit **132**A receives the main imaging instruction signal which is transmitted from the imaging apparatus control unit **62**C of the information processing apparatus **30**. In a case in which the main imaging instruction signal is received by the reception unit **132**A, the imaging system control unit **132**B executes the main imaging.

(226) As an example, as illustrated in FIG. **42**, in the imaging apparatus **34**, the imaging system

control unit **132**B acquires a still image **206** as the captured image **127** (refer to FIG. **4**) by executing the main imaging with the inspection object **16** (refer to FIG. **1**) as a subject. The transmission unit **132**D transmits the still image **206** acquired by the imaging system control unit **132**B to the information processing apparatus **30**.

(227) In the information processing apparatus **30**, the reception unit **62**A receives the still image **206** which is transmitted from the transmission unit **132**D of the imaging apparatus **34**. The determination unit **62**B determines whether or not the still image **206** has been received by the reception unit **62**A. In a case in which the determination unit **62**B determines that the still image **206** has been received by the reception unit **62**A, the composition unit **62**I acquires the still image **206** received by the reception unit **62**A. In addition, the composition unit **62**I acquires the pre-captured image **202** from the storage **64**. The composition unit **62**I overlaps the still image **206** with the pre-captured image **202** at an overlap ratio within the predetermined range described above and joins them into a panoramic image to generate the composite image **204**.

(228) The screen generation unit **62**D generates screen data **226** including a composite image using the composite image **204** generated by the composition unit **62**I. The screen data **226** including a composite image is screen data indicating a screen including a composite image. The screen including a composite image is, for example, screen data indicating a screen in which the pre-captured image **202** displayed in each wide view region **180**D of the imaging start screen **180**, the imaging condition adjustment screen **182**, the composition confirmation screen **184**, and imaging permission screen **186** is replaced with the latest composite image **204** generated by the composition unit **62**I. The transmission unit **62**H transmits the screen data **226** including a composite image to the tablet terminal **32**.

(229) As an example, as illustrated in FIG. **43**, on the imaging start screen **180** generated as the screen data **226** including a composite image, the composite image **204** obtained by joining a plurality of still images **206** into a panoramic image is displayed in the wide view region **180**D. In a state in which the imaging start screen **180** is displayed on the touch panel display **72**, the display control unit **78**A switches from the imaging start screen **180** to the composition confirmation screen **184** in response to the instruction received by the touch panel display **72**. Here, examples of the instruction received by the touch panel display **72** include, for example, the tap on the wide view region **180**D by the user **36**. In addition, the instruction is not limited to the tap on the wide view region **180**D, and may be a tap on the guide view region **180**C or may be a tap on the guide region **180**E. In addition, the tap is merely an example, and a long press may be performed, or a flick or a swipe may be performed instead of the tap.

(230) A reduced live view region **184**A is displayed at a lower left portion of the front view of the composition confirmation screen **184**, and a composite image confirmation view region **180**D1 is displayed at a central portion of the screen. The reduced live view region **184**A is a screen obtained by reducing the live view region **180**B, and in the reduced live view region **184**A, the entire live view region **180**B is displayed in a state of being reduced to a size that fits an outer frame of the reduced live view region **184**A.

(231) The composite image confirmation view region **180**D1 is displayed in a superimposed manner over the enlarged guide view region **180**C. The composite image confirmation view region **180**D1 is a region in which the wide view region **180**D is enlarged, and the composite image **204** is also enlarged and displayed in the composite image confirmation view region **180**D1 at the same magnification ratio as the magnification ratio of the wide view region **180**D. That is, the composite image confirmation view region **180**D1 is a region in which the wide view region **180**D is enlarged together with the composite image **204**. In a case in which the reduced live view region **184**A is tapped on the composition confirmation screen **184**, the display control unit **78**A switches the screen displayed on the touch panel display **72** from the composition confirmation screen **184** to the imaging start screen **180**.

(232) In a case in which the screens can be switched, the processor **78** of the tablet terminal **32**

requests the information processing apparatus **30** to switch the screens (for example, switching from the imaging start screen **180** to the composition confirmation screen **184**), and the processor **62** of the information processing apparatus **30** may generate the composition confirmation screen data indicating the screen after the switching (for example, the composition confirmation screen **184**) and transmit it to the tablet terminal **32**. Then, the processor **62** of the tablet terminal **32** may display the composition confirmation screen **184** indicated by the composition confirmation screen data transmitted from the information processing apparatus **30**, on the touch panel display **72**.

(233) Next, an action of the information processing system **12** will be explained with reference to FIGS. **44**A to **46**.

(234) First, the tablet side processing performed by the processor **78** of the tablet terminal **32** will be explained with reference to FIGS. **44**A to **44**C. In FIGS. **44**A to **44**C, an example of a flow of the tablet side processing performed by the processor **78** is illustrated.

(235) In the tablet side processing illustrated in FIG. **44**A, first, in Step ST**10**, the display control unit **78**A generates a startup setting screen **178** and displays the generated startup setting screen **178** on the touch panel display **72** (refer to FIG. **13**). After the processing of Step ST**10** is executed, the tablet side processing proceeds to Step ST**12**.

(236) In Step ST**12**, the determination unit **78**B determines whether or not the imaging start key **178**D in the startup setting screen **178** is turned on (refer to FIG. **13**). In Step ST**12**, in a case in which the imaging start key **178**D is not turned on, the determination is a negative determination, and the tablet side processing proceeds to Step ST**68** illustrated in FIG. **44**C. In Step ST**12**, in a case in which the imaging start key **178**D is turned on, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**14**.

(237) In Step ST**14**, the signal generation unit **78**C generates the live view imaging instruction signal and the distance measurement instruction signal. After the processing of Step ST**14** is executed, the tablet side processing proceeds to Step ST**16**.

(238) In Step ST**16**, the transmission unit **78**D transmits the live view imaging instruction signal and the distance measurement instruction signal generated in Step ST**14** to the information processing apparatus **30** (refer to FIGS. **15** and **17**). After the processing of Step ST**16** is executed, the tablet side processing proceeds to Step ST**18**.

(239) On condition that the processing of Step ST**16** is executed, the processing of Step ST**118** is executed in the inspection support processing illustrated in FIG. **45**A. By executing the processing of Step ST**118**, the imaging start screen data **200** (refer to FIG. **18**) is transmitted to the tablet terminal **32** from the information processing apparatus **30**.

(240) In Step ST**18**, the determination unit **78**B determines whether or not the imaging start screen data **200** has been received by the reception unit **78**E (refer to FIG. **21**). In Step ST**18**, in a case in which the imaging start screen data **200** has not been received by the reception unit **78**E, the determination is a negative determination, and the determination in Step ST**18** is performed again. In Step ST**18**, in a case in which the imaging start screen data **200** has been received by the reception unit **78**E, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**20**.

(241) In Step ST**20**, the display control unit **78**A displays the imaging start screen **180** indicated by the imaging start screen data **200** received by the reception unit **78**E, on the touch panel display **72** (refer to FIG. **21**). After the processing of Step ST**20** is executed, the tablet side processing proceeds to Step ST**22**.

(242) In Step ST**22**, the determination unit **78**B determines whether or not the instruction reception region **180**F in the imaging start screen **180**, which is displayed on the touch panel display **72**, has been tapped (refer to FIG. **22**). In Step ST**22**, in a case in which the instruction reception region **180**F has not been tapped, the determination is a negative determination, and the determination of Step ST**22** is performed again. In Step ST**22**, in a case in which the instruction reception region **180**F has been tapped, the determination is an affirmative determination, and the tablet side

processing proceeds to Step ST**24**.

(243) In Step ST**24**, the signal generation unit **78**C generates the imaging condition confirmation signal (refer to FIG. **22**). After the processing of Step ST**24** is executed, the tablet side processing proceeds to Step ST**26**.

(244) In Step ST**26**, the transmission unit **78**D transmits the imaging condition confirmation signal generated in Step ST**24** to the information processing apparatus **30** (refer to FIG. **22**). After the processing of Step ST**26** is executed, the tablet side processing proceeds to Step ST**28**.

(245) On condition that the processing of Step ST**26** is executed, the processing of Step ST**132**, the processing of Step ST**140**, and/or the processing of Step ST**148** are executed in the inspection support processing illustrated in FIGS. **45**B and **45**C. By executing the processing of Step ST**132**, the movement guidance screen data **218** (refer to FIG. **24**) is transmitted to the tablet terminal **32** from the information processing apparatus **30**. By executing the processing of Step ST**140**, the zoom guidance screen data **220** (refer to FIG. **27**) is transmitted to the tablet terminal **32** from the information processing apparatus **30**. By executing the processing of Step ST**148**, the inclination adjustment guidance screen data **222** (refer to FIG. **31**) is transmitted to the tablet terminal **32** from the information processing apparatus **30**.

(246) In Step ST**28**, the determination unit **78**B determines whether or not the movement guidance screen data **218** has been received by the reception unit **78**E (refer to FIG. **26**). In Step ST**28**, in a case in which the movement guidance screen data **218** has not been received by the reception unit **78**E, the determination is a negative determination, and the tablet side processing proceeds to Step ST**36** illustrated in FIG. **44**B. In Step ST**28**, in a case in which the movement guidance screen data **218** has been received by the reception unit **78**E, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**30**.

(247) In Step ST**30**, the display control unit **78**A displays the movement guidance screen **190** indicated by the movement guidance screen data **218** received by the reception unit **78**E, on the touch panel display **72** (refer to FIG. **26**). After the processing of Step ST**30** is executed, the tablet side processing proceeds to Step ST**32**.

(248) In Step ST**32**, the determination unit **78**B determines whether or not the adjustment instruction has been given to the movement guidance screen **190** (refer to FIG. **26**) displayed on the touch panel display **72**. Here, the adjustment instruction refers to, for example, a tap on the marks **190**A**1** to **190**A (refer to FIG. **26**) of the instruction reception region **190**A. In Step ST**32**, in a case in which the adjustment instruction has not been given to the movement guidance screen **190**, the determination is a negative determination, and the determination of Step ST**32** is performed again. In Step ST**32**, in a case in which the adjustment instruction has been given to the movement guidance screen **190**, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**34**.

(249) In Step ST**34**, the adjustment value calculation unit **78**F calculates the adjustment value according to the adjustment instruction given to the movement guidance screen **190** (refer to FIG. **26**) (refer to FIG. **34**). After the processing of Step ST**34** is executed, the tablet side processing proceeds to Step ST**36** illustrated in FIG. **44**B.

(250) In Step ST**36** illustrated in FIG. **44**B, the determination unit **78**B determines whether or not the zoom guidance screen data **220** has been received by the reception unit **78**E (refer to FIG. **30**). In Step ST**36**, in a case in which the zoom guidance screen data **220** has not been received by the reception unit **78**E, the determination is a negative determination, and the tablet side processing proceeds to Step ST**44**. In Step ST**36**, in a case in which the zoom guidance screen data **220** has been received by the reception unit **78**E, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**38**.

(251) In Step ST**38**, the display control unit **78**A displays the zoom guidance screen indicated by the zoom guidance screen data **220** received by the reception unit **78**E, on the touch panel display **72** (refer to FIG. **30**). After the processing of Step ST**38** is executed, the tablet side processing

proceeds to Step ST**40**.

(252) In Step ST**40**, the determination unit **78**B determines whether or not the adjustment instruction has been given to the zoom guidance screen (refer to FIG. **30**) displayed on the touch panel display **72**. Here, the adjustment instruction refers to, for example, a pinch-out operation and/or a pinch-in operation with respect to the instruction reception region **192**A or **194**A. In Step ST**40**, in a case in which the adjustment instruction has not been given to the zoom guidance screen, the determination is a negative determination, and the determination of Step ST**40** is performed again. In Step ST**40**, in a case in which the adjustment instruction has been given to the zoom guidance screen, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**42**.

(253) In Step ST**42**, the adjustment value calculation unit **78**F calculates the adjustment value according to the adjustment instruction given to the zoom guidance screen (refer to FIG. **30**) (refer to FIG. **34**). After the processing of Step ST**42** is executed, the tablet side processing proceeds to Step ST**44**.

(254) In Step ST**44**, the determination unit **78**B determines whether or not the inclination adjustment guidance screen data **222** has been received by the reception unit **78**E (refer to FIG. **33**). In Step ST**44**, in a case in which the inclination adjustment guidance screen data **222** has not been received by the reception unit **78**E, the determination is a negative determination, and the tablet side processing proceeds to Step ST**52**. In Step ST**44**, in a case in which the inclination adjustment guidance screen data **222** has been received by the reception unit **78**E, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**46**.

(255) In Step ST**46**, the display control unit **78**A displays the inclination adjustment guidance screen **196** indicated by the inclination adjustment guidance screen data **222** received by the reception unit **78**E, on the touch panel display **72** (refer to FIG. **33**). After the processing of Step ST**46** is executed, the tablet side processing proceeds to Step ST**48**.

(256) In Step ST**48**, the determination unit **78**B determines whether or not the adjustment instruction has been given to the inclination adjustment guidance screen **196** (refer to FIG. **33**) displayed on the touch panel display **72**. Here, the adjustment instruction refers to, for example, a pinch-out operation and/or a pinch-in operation with respect to the instruction reception region **196**A (refer to FIG. **33**). In Step ST**48**, in a case in which the adjustment instruction has not been given to the inclination adjustment guidance screen **196**, the determination is a negative determination, and the determination of Step ST**48** is performed again. In Step ST**48**, in a case in which the adjustment instruction has been given to the inclination adjustment guidance screen **196**, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**50**.

(257) In Step ST**50**, the adjustment value calculation unit **78**F calculates the adjustment value according to the adjustment instruction given to the inclination adjustment guidance screen **196** (refer to FIG. **33**) (refer to FIG. **34**). After the processing of Step ST**50** is executed, the tablet side processing proceeds to Step ST**52**.

(258) In Step ST**52**, the determination unit **78**B determines whether or not the adjustment value has been calculated in at least one processing of the processing of Step ST**34**, the processing of Step ST**42**, or the processing of Step ST**50**. In Step ST**52**, in a case in which the adjustment value has not been calculated in at least one processing of the processing of Step ST**34**, the processing of Step ST**42**, or the processing of Step ST**50**, the determination is a negative determination, and the tablet side processing proceeds to Step ST**58** illustrated in FIG. **44**C. In Step ST**52**, in a case in which the adjustment value has not been calculated in at least one processing of the processing of Step ST**34**, the processing of Step ST**42**, or the processing of Step ST**50**, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**54**.

(259) In Step ST**54**, the signal generation unit **78**C generates an adjustment result signal (refer to FIG. **34**). After the processing of Step ST**54** is executed, the tablet side processing proceeds to Step

ST**56**.

(260) In Step ST**56**, the transmission unit **78**D transmits the adjustment result signal generated in Step ST**54** to the information processing apparatus **30** (refer to FIG. **34**). After the processing of Step ST**56** is executed, the tablet side processing proceeds to Step ST**58** illustrated in FIG. **44**C.

(261) On condition that the processing of Step ST**56** is executed, the imaging permission screen data **224** (refer to FIG. **37**) is transmitted to the tablet terminal **32** from the information processing apparatus **30** in the inspection support processing illustrated in FIG. **45**D by executing the processing of Step ST**160**.

(262) In Step ST**58** illustrated in FIG. **44**C, the determination unit **78**B determines whether or not the imaging permission screen data **224** transmitted from the information processing apparatus **30** has been received by the reception unit **78**E (refer to FIG. **39**). In Step ST**58**, in a case in which the imaging permission screen data **224** has not been received by the reception unit **78**E, the determination is a negative determination, and the determination of Step ST**58** is performed again. In Step ST**58**, in a case in which the imaging permission screen data **224** has been received by the reception unit **78**E, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**60**.

(263) In Step ST**60**, the display control unit **78**A displays the imaging permission screen **186** indicated by the imaging permission screen data **224** received by the reception unit **78**E, on the touch panel display **72** (refer to FIG. **39**). After the processing of Step ST**60** is executed, the tablet side processing proceeds to Step ST**62**.

(264) In Step ST**62**, the determination unit **78**B determines whether or not the imaging instruction reception region **186**A in the imaging permission screen **186**, which is displayed on the touch panel display **72**, has been tapped (refer to FIG. **40**). In Step ST**62**, in a case in which the imaging instruction reception region **186**A has not been tapped, the determination is a negative determination, and the determination of Step ST**62** is performed again. In Step ST**62**, in a case in which the imaging instruction reception region **186**A has been tapped, the determination is an affirmative determination, and the tablet side processing proceeds to Step ST**64**.

(265) In Step ST**64**, the signal generation unit **78**C generates the main imaging instruction signal (refer to FIG. **40**). After the processing of Step ST**64** is executed, the tablet side processing proceeds to Step ST**66**.

(266) In Step ST**66**, the transmission unit **78**D transmits the main imaging instruction signal generated in Step ST**64** to the information processing apparatus **30** (refer to FIG. **40**). After the processing of Step ST**66** is executed, the tablet side processing proceeds to Step ST**68**.

(267) In Step ST**68**, the determination unit **78**B determines whether or not a condition for ending the tablet side processing (hereinafter, referred to as "tablet side processing end condition") is satisfied. A first example of the tablet side processing end condition includes a condition that an instruction to end the tablet side processing is received by the touch panel display **72**. A second example of the tablet side processing end condition includes a condition that a predetermined time (for example, 15 minutes) has elapsed without executing the processing of Step ST**66** after the execution of the tablet side processing is started.

(268) In Step ST**68**, in a case in which the tablet side processing end condition is not satisfied, the determination is a negative determination, and the tablet side processing proceeds to Step ST**14** shown in FIG. **44**A. In Step ST**68**, in a case in which the tablet side processing end condition is satisfied, the determination is an affirmative determination, and the tablet side processing ends.

(269) Next, the inspection support processing performed by the processor **62** of the information processing apparatus **30** will be explained with reference to FIGS. **45**A to **45**D. In FIGS. **45**A to **45**D, an example of a flow of inspection support processing performed by the processor **62** is illustrated.

(270) In the inspection support processing illustrated in FIG. **45**A, first, in Step ST**100**, the determination unit **62**B determines whether or not the distance measurement instruction signal

transmitted from the tablet terminal **32** has been received by the reception unit **62**A by executing the processing of Step ST**16** illustrated in FIG. **44**A (refer to FIG. **15**). In Step ST**100**, in a case in which the distance measurement instruction signal has not been received by the reception unit **62**A, the determination is a negative determination, and the inspection support processing proceeds to Step ST**108**. In Step ST**100**, in a case in which the distance measurement instruction signal has been received by the reception unit **62**A, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**102**.

(271) In Step ST**102**, the imaging apparatus control unit **62**C transmits the distance measurement instruction signal received by the reception unit **62**A to the imaging apparatus **34** (refer to FIG. **15**). After the processing of Step ST**102** is executed, the inspection support processing proceeds to Step ST**104**.

(272) On condition that the processing of Step ST**102** is executed, the distance measurement result **150** is transmitted to the information processing apparatus **30** from the imaging apparatus **34** in the imaging apparatus side processing illustrated in FIG. **46** by executing the processing of Step ST**206** (refer to FIGS. **5** and **16**).

(273) In Step ST**104**, the determination unit **62**B determines whether or not the distance measurement result **150** transmitted from the imaging apparatus **34** has been received by the reception unit **62**A (refer to FIG. **16**). In Step ST**104**, in a case in which the distance measurement result **150** has not been received by the reception unit **62**A, the determination is a negative determination, and the determination of Step ST**104** is performed again. In Step ST**104**, in a case in which the distance measurement result **150** has been received by the reception unit **62**A, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**106**.

(274) In Step ST**106**, the acquisition unit **62**G acquires the distance measurement result **150** received by the reception unit **62**A, and overwrites and stores the acquired distance measurement result **150** in the RAM **66** (refer to FIG. **16**). After the processing of Step ST**106** is executed, the inspection support processing proceeds to Step ST**108**.

(275) In Step ST**108**, the determination unit **62**B determines whether or not the live view imaging instruction signal transmitted from the tablet terminal **32** has been received by the reception unit **62**A by executing the processing of Step ST**16** illustrated in FIG. **44**A (refer to FIG. **17**). In Step ST**108**, in a case in which the live view imaging instruction signal has not been received by the reception unit **62**A, the determination is a negative determination, and the inspection support processing proceeds to Step ST**100**. In Step ST**108**, in a case in which the live view imaging instruction signal has been received by the reception unit **62**A, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**110**.

(276) In Step ST**110**, the imaging apparatus control unit **62**C transmits the live view imaging instruction signal received by the reception unit **62**A to the imaging apparatus **34** (refer to FIG. **17**). After the processing of Step ST**110** is executed, the inspection support processing proceeds to Step ST**112**.

(277) On condition that the processing of Step ST**110** is executed, the live view image **198** is transmitted to the information processing apparatus **30** from the imaging apparatus **34** in the imaging apparatus side processing illustrated in FIG. **46** by executing the processing of Step ST**214** (refer to FIG. **18**).

(278) In Step ST**112**, the determination unit **62**B determines whether or not the live view image **198** transmitted from the imaging apparatus **34** has been received by the reception unit **62**A (refer to FIG. **18**). In Step ST**112**, in a case in which the live view image **198** has not been received by the reception unit **62**A, the determination is a negative determination, and the determination of Step ST**112** is performed again. In Step ST**112**, in a case in which the live view image **198** has been received by the reception unit **62**A, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**114**.

(279) In Step ST**114**, the acquisition unit **62**G acquires the live view image **198** received by the reception unit **62**A, and overwrites and stores the acquired live view image **198** in the RAM **66** (refer to FIG. **18**). After the processing of Step ST**114** is executed, the inspection support processing proceeds to Step ST**116**.

(280) In Step ST**116**, the screen generation unit **62**D generates the imaging start screen data **200** (refer to FIG. **18**). After the processing of Step ST**116** is executed, the inspection support processing proceeds to Step ST**118**.

(281) In Step ST**118**, the transmission unit **62**H transmits the imaging start screen data **200** generated in Step ST**116** to the tablet terminal **32** (refer to FIG. **18**). After the processing of Step ST**118** is executed, the inspection support processing proceeds to Step ST**120** illustrated in FIG. **45**B.

(282) In Step ST**120** illustrated in FIG. **45**B, the determination unit **62**B determines whether or not the imaging condition confirmation signal transmitted from the tablet terminal **32** has been received by the reception unit **62**A by executing the processing of Step ST**26** illustrated in FIG. **44**A (refer to FIG. **23**). In Step ST**120**, in a case in which the imaging condition confirmation signal has not been received by the reception unit **62**A, the determination is a negative determination, and the determination of Step ST**120** is performed again. In Step ST**120**, in a case in which the imaging condition confirmation signal has been received by the reception unit **62**A, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**122**.

(283) In Step ST**122**, the acquisition unit **62**G acquires the pre-captured image **202** from the storage **64** and acquires the live view image **198** and the distance measurement result **150** from the RAM **66** (refer to FIG. **23**). After the processing of Step ST**122** is executed, the inspection support processing proceeds to Step ST**124**.

(284) In Step ST**124**, the calculation unit **62**E calculates the overlap ratio, the zoom magnification, and the inclined angle using the pre-captured image **202**, the live view image **198**, and the distance measurement result **150**, which are acquired in Step ST**122** (refer to FIG. **23**). After the processing of Step ST**124** is executed, the inspection support processing proceeds to Step ST**126**.

(285) In Step ST**126**, the determination unit **62**B determines whether or not the overlap ratio calculated in Step ST**124** is outside the predetermined range (refer to FIG. **24**). In Step ST**126**, in a case in which the overlap ratio is within the predetermined range, the determination is a negative determination, and the inspection support processing proceeds to Step ST**134** illustrated in FIG. **45**C. In Step ST**126**, in a case in which the overlap ratio is outside the predetermined range, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**128**.

(286) In Step ST**128**, the calculation unit **62**E calculates the movement direction and the movement amount that can keep the overlap ratio within the predetermined range as the movement direction and the movement amount of the imaging range by the imaging apparatus **34** (refer to FIG. **24**). After the processing of Step ST**128** is executed, the inspection support processing proceeds to Step ST**130**.

(287) In Step ST**130**, the screen generation unit **62**D generates the movement guidance screen data **218** based on the movement direction and the movement amount calculated in Step ST**128** (refer to FIG. **24**). After the processing of Step ST**130** is executed, the inspection support processing proceeds to Step ST**132**.

(288) In Step ST**132**, the transmission unit **62**H transmits the movement guidance screen data **218** generated in Step ST**130** to the tablet terminal **32** (refer to FIG. **24**). After the processing of Step ST**132** is executed, the inspection support processing proceeds to Step ST**134** illustrated in FIG. **45**C.

(289) In Step ST**134** illustrated in FIG. **45**C, the determination unit **62**B determines whether or not it is necessary to change the zoom magnification of the imaging apparatus **34** with reference to the zoom magnification calculated in Step ST**124** (refer to FIG. **27**). In Step ST**134**, in a case in which

the change of the zoom magnification is not necessary, the determination is a negative determination, and the inspection support processing proceeds to Step ST**142**. In Step ST**134**, in a case in which the change of the zoom magnification is necessary, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**136**.

(290) In Step ST**136**, the calculation unit **62**E calculates the insufficient zoom magnification (refer to FIG. **27**). After the processing of Step ST**136** is executed, the inspection support processing proceeds to Step ST**138**.

(291) In Step ST**138**, the screen generation unit **62**D generates the zoom guidance screen data **220** based on the insufficient zoom magnification calculated in Step ST**136** (refer to FIG. **27**). After the processing of Step ST**138** is executed, the inspection support processing proceeds to Step ST**140**.

(292) In Step ST**140**, the transmission unit **62**H transmits the zoom guidance screen data **220** generated in Step ST**138** to the tablet terminal **32** (refer to FIG. **27**). After the processing of Step ST**140** is executed, the inspection support processing proceeds to Step ST**142**.

(293) In Step ST**142**, the determination unit **62**B determines whether or not the inclined angle calculated in Step ST**124** is an angle other than the facing angle (refer to FIG. **31**). In Step ST**142**, in a case in which the inclined angle is the facing angle, the determination is a negative determination, and the inspection support processing proceeds to Step ST**150**. In Step ST**142**, in a case in which the inclined angle is an angle other than the facing angle, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**144**.

(294) In Step ST**144**, the calculation unit **62**E calculates a difference angle, which is an angle of difference between the inclined angle and the facing angle calculated in Step ST**124** (refer to FIG. **31**). After the processing of Step ST**144** is executed, the inspection support processing proceeds to Step ST**146**.

(295) In Step ST**146**, the screen generation unit **62**D generates the inclination adjustment guidance screen data **222** based on the difference angle calculated in Step ST**144** (refer to FIG. **31**). After the processing of Step ST**146** is executed, the inspection support processing proceeds to Step ST**148**.

(296) In Step ST**148**, the transmission unit **62**H transmits the inclination adjustment guidance screen data **222** generated in Step ST**146** to the tablet terminal **32** (refer to FIG. **31**). After the processing of Step ST**148** is executed, the inspection support processing proceeds to Step ST**150**.

(297) In Step ST**150**, the determination unit **62**B determines whether or not the adjustment result signal transmitted from the tablet terminal **32** has been received by the reception unit **62**A by executing the processing of Step ST**56** illustrated in FIG. **44**B (refer to FIG. **35**). In Step ST**150**, in a case in which the adjustment result signal has not been received by the reception unit **62**A, the determination is a negative determination, and the inspection support processing proceeds to Step ST**154**. In Step ST**150**, in a case in which the adjustment result signal has been received by the reception unit **62**A, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**152**.

(298) In Step ST**152**, the drive system control unit **62**F controls the drive system **14** in accordance with the adjustment result signal received by the reception unit **62**A, and the imaging apparatus control unit **62**C executes the optical zoom by moving the zoom lens **98**C (refer to FIG. **4**) of the imaging apparatus **34** in accordance with the adjustment result signal received by the reception unit **62**A along the optical axis OA (refer to FIG. **35**). After the processing of Step ST**152** is executed, the inspection support processing proceeds to Step ST**154**.

(299) In Step ST**154**, the determination unit **62**B determines whether or not the imaging condition necessary for executing the main imaging for creating the composite image **204** is satisfied. Here, examples of the imaging condition necessary for executing the main imaging for creating the composite image **204** include a condition that the overlap ratio is within the predetermined range, the change of the zoom magnification is not necessary, and the inclined angle is the facing angle positive (refer to FIG. **36**). In Step ST**154**, in a case in which the imaging condition necessary for executing the main imaging for creating the composite image **204** is not satisfied, the determination

is a negative determination, and the inspection support processing proceeds to Step ST**166** illustrated in FIG. **45**D. In Step ST**154**, in a case in which the imaging condition necessary for executing the main imaging for creating the composite image **204** is satisfied, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**156**.

(300) In Step ST**156**, the signal generation unit **62**J generates the imageable signal and stores the generated imageable signal in the RAM **66** (refer to FIG. **36**). After the processing of Step ST**156** is executed, the inspection support processing proceeds to Step ST**158** illustrated in FIG. **45**D.

(301) In Step ST**158** illustrated in FIG. **45**D, the screen generation unit **62**D generates the imaging permission screen data **224** (refer to FIG. **37**). That is, the screen generation unit **62**D generates the imaging permission screen data **224** on condition that the imageable signal is stored in the RAM **66**. After the processing of Step ST**158** is executed, the inspection support processing proceeds to Step ST**160**.

(302) In Step ST**160**, the transmission unit **62**H transmits the imaging permission screen data **224** generated in Step ST**158** to the tablet terminal **32** and erases the imageable signal from the RAM **66** (refer to FIG. **37**). After the processing of Step ST**160** is executed, the inspection support processing proceeds to Step ST**162**.

(303) In Step ST**162**, the determination unit **62**B determines whether or not the main imaging instruction signal transmitted from the tablet terminal **32** has been received by the reception unit **62**A by executing the processing of Step ST**66** illustrated in FIG. **44**C (refer to FIG. **41**). In Step ST**162**, in a case in which the main imaging instruction signal has not been received by the reception unit **62**A, the determination is a negative determination, and the determination of Step ST**162** is performed again. In Step ST**162**, in a case in which the main imaging instruction signal has been received by the reception unit **62**A, the determination is an affirmative determination, and the inspection support processing proceeds to Step ST**164**.

(304) In Step ST**164**, the imaging apparatus control unit **62**C transmits the main imaging instruction signal received by the reception unit **62**A to the imaging apparatus **34** (refer to FIG. **41**). After the processing of Step ST**164** is executed, the inspection support processing proceeds to Step ST**166**.

(305) In Step ST**166**, the determination unit **62**B determines whether or not a condition for ending the inspection support processing (hereinafter, referred to as "inspection support processing end condition") is satisfied. A first example of the inspection support processing end condition includes a condition that an instruction to end the inspection support processing is given to the information processing apparatus **30**. A second example of the inspection support processing end condition includes a condition that the predetermined time (for example, 15 minutes) has elapsed without executing the processing of Step ST**164** after the execution of the inspection support processing is started.

(306) In Step ST**166**, in a case in which the inspection support processing end condition is not satisfied, the determination is a negative determination, and the inspection support processing proceeds to Step ST**100** illustrated in FIG. **45**A. In Step ST**166**, in a case in which the inspection support processing end condition is satisfied, the determination is an affirmative determination, and the inspection support processing ends.

(307) Next, the imaging apparatus side processing performed by the processor **132** of the imaging apparatus **34** will be explained with reference to FIG. **46**. In FIG. **46**, an example of a flow of the imaging apparatus side processing performed by the processor **132** is illustrated.

(308) In the imaging apparatus side processing illustrated in FIG. **46**, first, in Step ST**200**, the distance measurement system control unit **132**C determines whether or not the distance measurement instruction signal transmitted from the information processing apparatus **30** has been received by the reception unit **132**A by executing the processing of Step ST**102** illustrated in FIG. **45**A. In Step ST**200**, in a case in which the distance measurement instruction signal has not been received by the reception unit **132**A, the determination is a negative determination, and the imaging

apparatus side processing proceeds to Step ST**208**. In Step ST**200**, in a case in which the distance measurement instruction signal has been received by the reception unit **132**A, the determination is an affirmative determination, and the imaging apparatus side processing proceeds to Step ST**202**.

(309) In Step ST**202**, the distance measurement system control unit **132**C causes the 3D sensor **38** (refer to FIGS. **1** and **5**) to execute distance measurement (refer to FIGS. **15** and **16**). After the processing of Step ST**202** is executed, the imaging apparatus side processing proceeds to Step ST**204**.

(310) In Step ST**204**, the distance measurement system control unit **132**C acquires the distance measurement result **150** from the 3D sensor **38** (refer to FIG. **16**). After the processing of Step ST**204** is executed, the imaging apparatus side processing proceeds to Step ST**206**.

(311) In Step ST**206**, the transmission unit **132**D transmits the distance measurement result **150** acquired in Step ST**204** to the information processing apparatus **30** (refer to FIG. **16**). After the processing of Step ST**206** is executed, the imaging apparatus side processing proceeds to Step ST**208**.

(312) In Step ST**208**, the imaging system control unit **132**B determines whether or not the live view imaging instruction signal transmitted by executing the processing of Step ST**110** illustrated in FIG. **45**A has been received by the reception unit **132**A. In Step ST**208**, in a case in which the live view imaging instruction signal has not been received by the reception unit **132**A, the determination is a negative determination, and the imaging apparatus side processing proceeds to Step ST**220**. In Step ST**208**, in a case in which the live view imaging instruction signal has been received by the reception unit **132**A, the determination is an affirmative determination, and the imaging apparatus side processing proceeds to Step ST**210**.

(313) In Step ST**210**, the imaging system control unit **132**B executes imaging for a live view image (refer to FIGS. **17** and **18**). After the processing of Step ST**210** is executed, the imaging apparatus side processing proceeds to Step ST**212**.

(314) In Step ST**212**, the imaging system control unit **132**B acquires the live view image **198** (refer to FIG. **18**). After the processing of Step ST**212** is executed, the imaging apparatus side processing proceeds to Step ST**214**.

(315) In Step ST**214**, the transmission unit **132**D transmits the live view image **198** acquired in Step ST**212** to the information processing apparatus **30** (refer to FIG. **18**). After the processing of Step ST**214** is executed, the imaging apparatus side processing proceeds to Step ST**216**.

(316) In Step ST**216**, the imaging system control unit **132**B determines whether or not the main imaging instruction signal transmitted from the information processing apparatus **30** by executing the processing of Step ST**164** illustrated in FIG. **45**D has been received by the reception unit **132**A. In Step ST**216**, in a case in which the main imaging instruction signal has not been received by the reception unit **132**A, the determination is a negative determination, and the imaging apparatus side processing proceeds to Step ST**220**. In Step ST**216**, in a case in which the main imaging instruction signal has been received by the reception unit **132**A, the determination is an affirmative determination, and the imaging apparatus side processing proceeds to Step ST**218**.

(317) In Step ST**218**, the imaging system control unit **132**B acquires the still image **206** by executing the main imaging. Then, the transmission unit **132**D transmits the still image **206** acquired by the imaging system control unit **132**B to the information processing apparatus **30**. After the processing of Step ST**218** is executed, the imaging apparatus side processing proceeds to Step ST**220**.

(318) The still image **206**, which is transmitted to the information processing apparatus **30** by performing the processing Step ST**218** is composed with the pre-captured image **202** by the composition unit **62**I of the information processing apparatus **30** to join them into a panoramic image, and the composite image **204** is generated (refer to FIG. **42**). In addition, in the information processing apparatus **30**, screen data **226** including a composite image is transmitted to the tablet terminal **32** by the screen generation unit **62**D based on the composite image **204** obtained by the

composition unit **62**I (refer to FIG. **42**). In the tablet terminal **32**, the touch panel display **72** displays the screen containing a composite image indicated by the screen data **226** including a composite image. The composite image **204** is displayed on the screen containing a composite image (refer to FIG. **43**). The composite image **204** is enlarged or reduced according to an instruction given to the touch panel display **72** (refer to FIG. **43**).

(319) In Step ST**220**, the imaging system control unit **132**B determines whether or not a condition for ending the imaging apparatus side processing (hereinafter, referred to as "imaging apparatus side processing end condition") is satisfied. A first example of the imaging apparatus side processing end condition includes a condition that an instruction to end the imaging apparatus side processing is given to the imaging apparatus **34**. A second example of the imaging apparatus side processing end condition includes a condition that the predetermined time (for example, 15 minutes) has elapsed without executing the processing of Step ST**218** after the execution of the imaging apparatus side processing is started.

(320) In Step ST**220**, in a case in which the imaging apparatus side processing end condition is not satisfied, the determination is a negative determination, and the imaging apparatus side processing proceeds to Step ST**200**. In Step ST**200**, in a case in which the imaging apparatus side processing end condition is satisfied, the determination is an affirmative determination, and the imaging apparatus side processing ends.

(321) As explained above, in the information processing apparatus **30**, the imageable signal is set based on the captured image **127** and the distance measurement result **150**. The imageable signal is a signal indicating that the main imaging by the imaging apparatus **34** is determined to be executable. In the information processing apparatus **30**, in a case in which the imageable signal is set, the imaging permission screen data **224** indicating the imaging permission screen **186** including the imaging instruction reception region **186**A is transmitted to the tablet terminal **32**. Then, in a case in which the imaging instruction reception region **186**A included in the imaging permission screen **186** displayed on the touch panel display **72** of the tablet terminal **32** is tapped, the main imaging instruction signal indicating the instruction to make the imaging apparatus **34** to execute the main imaging with respect to the imaging scene illustrated by the live view image **198** is transmitted to the imaging apparatus **34**. In the imaging apparatus **34**, the main imaging is executed on condition that the main imaging instruction signal is received. Therefore, with the present configuration, as compared with a case in which the user **36** is notified of a timing determined without using either the captured image **127** or the distance measurement result **150** as an imaging timing, the imaging apparatus **34** can execute the main imaging at a good timing.

(322) In addition, in the information processing apparatus **30**, the composite image **204** is generated. The composite image **204** is an image illustrating an imaging scene wider than the imaging scene illustrated by the live view image **198**. Therefore, with the present configuration, the user **36** can visually recognize a scene wider than the imaging scene illustrated by the live view image **198**.

(323) In addition, in the information processing apparatus **30**, an image obtained by joining a plurality of still images **206** into a panoramic image is generated as a composite image **204**. Therefore, with the present configuration, as compared with a case in which the plurality of still images **206** are sequentially displayed frame by frame, the user **36** can easily visually recognize the area where the main imaging is executed.

(324) In addition, in the information processing apparatus **30**, data indicating a screen including the composite image confirmation view region **180**D1 in which the wide view region **180**D is enlarged together with the composite image **204** is transmitted to the tablet terminal **32** as screen data **226** including a composite image, and the composition confirmation screen **184** is displayed on the touch panel display **72** of the tablet terminal **32** as a screen including the composite image confirmation view region **180**D1. Therefore, with the present configuration, it is possible to improve the visibility of the composite image **204** as compared with a case in which the composite

image **204** is not enlarged.

(325) In addition, in the information processing apparatus **30**, a distance measurement instruction signal is transmitted to the imaging apparatus **34** as a signal indicating an instruction to the imaging apparatus **34** to acquire the distance measurement result and a signal indicating an instruction to the imaging apparatus **34** to measure a distance between the inspection object **16** and the imaging apparatus **34**. The imaging apparatus **34** executes distance measurement in a case in which the distance measurement instruction signal is received. Therefore, with the present configuration, it is possible to cause the imaging apparatus **34** to acquire the distance measurement result without the user **36** directly touching the imaging apparatus **34** and operating the imaging apparatus **34**. In addition, it is possible to cause the imaging apparatus **34** to measure the distance between the inspection object **16** and the imaging apparatus **34** without the user **36** directly touching the imaging apparatus **34** and operating the imaging apparatus **34**.

(326) In addition, in the information processing apparatus **30**, the main imaging instruction signal is transmitted to the imaging apparatus **34** on condition that the imageable signal is generated. Accordingly, the imaging apparatus **34** executes the main imaging. The imageable signal is generated on condition that the inclined angle calculated by the calculation unit **62**E is the facing angle. Therefore, with the present configuration, it is possible to obtain the still image **206** having a smaller inclination than in a case in which the imageable signal is generated in a case in which the inclined angle is an angle other than the facing angle.

(327) In addition, in the information processing apparatus **30**, the main imaging instruction signal is transmitted to the imaging apparatus **34** on condition that the imageable signal is generated. Accordingly, the imaging apparatus **34** executes the main imaging. The imageable signal is generated on condition that the overlap ratio calculated by the calculation unit **62**E is within the predetermined range. Therefore, with the present configuration, the occurrence of a missing part (for example, a blank region) in the composite image **204** can be suppressed as compared with a case in which the overlap ratio is not considered at all in generating the composite image **204** in which the plurality of still images **206** are joining into a panoramic image.

(328) In addition, in the information processing apparatus **30**, the determination unit **62**B acquires information indicating whether or not the inclined angle is the facing angle as the information based on the distance measurement result **150** (refer to FIGS. **31** and **36**). Therefore, with the present configuration, it is possible to obtain the information indicating whether or not the inclined angle is the facing angle without the user **36** directly touching the imaging apparatus **34** and operating the imaging apparatus **34**.

(329) In addition, in the information processing apparatus **30**, the imaging system control unit **132**B acquires the distance image **148** as information based on the distance between the inspection object **16** and the imaging apparatus **34** (refer to FIGS. **5** and **16**). Therefore, it is possible to obtain the distance image **148** without the user **36** directly touching the imaging apparatus **34** and operating the imaging apparatus **34**.

(330) In the above-described embodiment, although the real space area of the imaging region indicated by the composite image **204** (hereinafter, also simply referred to as "real space area") is not calculated, the real space area may be calculated by the calculation unit **62**E as illustrated in FIG. **47** as an example. In this case, for example, the calculation unit **62**E calculates a length L of the area in the real space included in the subject (for example, the inspection object **16**) using the following Formula (1), and calculates a real space area using the calculated L. In Formula (1), L is a length of the area in real space included in the subject (for example, the inspection object **16**), u1 and u2 are addresses of designated pixels in the composite image **204**, D is a distance measured by the 3D sensor **38**, p is a pitch between the photosensitive pixels included in the photoelectric conversion element **96**, and f is a focal length of the imaging lens **98**.

(331) $L = D \times \{\frac{p(u1 - u2)}{f}\}$ (1)

(332) The screen generation unit **62**D generates screen data **228** indicating a screen including the real space area calculated by the calculation unit **62**E. The transmission unit **62**H transmits the screen data **228**, which is generated by the screen generation unit **62**D, to the tablet terminal **32**. The screen data **228** is, for example, screen data indicating a screen including a real space area in at least one screen of the imaging start screen **180**, the imaging condition adjustment screen **182**, the composition confirmation screen **184**, or the imaging permission screen **186** illustrated in FIG. **12**. On the touch panel display **72** of the tablet terminal **32**, the screen indicated by the screen data **228** is displayed. In the example illustrated in FIG. **48**, the composition confirmation screen **184** including the display region **184**B is illustrated as an example of the screen indicated by the screen data **228**. The display region **184**B is displayed in a popped-up state from the composite image confirmation view region **180**D1. The real space area calculated by the calculation unit **62**E is displayed in the display region **184**B. Therefore, the real space area of the imaging region indicated by the composite image **204** can be grasped visually.

(333) In the example illustrated in FIG. **47**, although the screen data **228** indicating the screen including the real space area is transmitted from the information processing apparatus **30** to the tablet terminal **32**, the technology of the present disclosure is not limited to this. The processor **62** of the information processing apparatus **30** may transmit the distance measurement result data for displaying the information based on the distance measurement result **150** on the touch panel display **72**, to the tablet terminal **32**.

(334) In this case, for example, the screen generation unit **62**D generates screen data indicating the screen including the distance measurement result data as the screen data **228**, and the transmission unit **62**H transmits the screen data **228** generated by the screen generation unit **62**D to the tablet terminal **32**.

(335) Here, a first example of the distance measurement result data includes the distance image **148**. In addition, a second example of the distance measurement result data includes a distance from the imaging apparatus **34** to a specific position (for example, a position designated by the user **36**) in the inspection object **16**. In addition, a third example of the distance measurement result data includes facing information indicating a determination result of whether or not the inclined angle is the facing angle. In addition, a fourth example of the distance measurement result data includes a focus area frame which is a frame indicating a focus area specified based on the distance measurement result **150**.

(336) FIG. **49** illustrates an example of an aspect in which the composition confirmation screen **184** is displayed on the touch panel display **72** as the screen indicated by the screen data **228** generated based on the distance measurement result data by the screen generation unit **62**D. In the example illustrated in FIG. **49**, the composition confirmation screen **184** has the distance measurement information display region **230**. In the distance measurement information display region **230**, information indicating a distance to a position designated by the user **36** is displayed in a message format. Accordingly, this allows the user **36** to visually recognize the distance to the position designated by the user **36**. In addition, numerical values indicating a distance from the imaging apparatus **34** to a position designated by the user **36** in the composite image **204** displayed in the composite image confirmation view region **180**D1 (50.0 m and 35.2 m in the example illustrated in FIG. **49**) are displayed.

(337) In the example illustrated in FIG. **49**, although the message and the numerical value related to the distance are displayed on the touch panel display **72**, the present disclosure is not limited to this, and the distance image **148**, the facing information, and/or the focus area frame may also be displayed on the touch panel display **72**. In addition, in this case, the facing information may be displayed in the distance measurement information display region **230** in a message format.

(338) In the above-described embodiment, although the main imaging is started by tapping the imaging instruction reception region **186**A, the technology of the present disclosure is not limited to this, and the main imaging may be started by operating the release button **146** (refer to FIG. **4**).

(339) In the above-described embodiment, although an example of the embodiment in which the inspection support processing is performed by the information processing apparatus **30** has been explained, the technology of the present disclosure is not limited to this. For example, the inspection support processing may be performed by the tablet terminal **32** and/or the imaging apparatus **34**. In this case, the tablet terminal **32** may directly communicate with the drive system **14** and the imaging apparatus **34** without going through the information processing apparatus **30**. In addition, a plurality of apparatuses (for example, the information processing apparatus **30** and the tablet terminal **32**) may perform the inspection support processing in a distributed manner.

(340) In the above-described embodiment, although an example of the embodiment in which various screens (for example, various screens illustrated in FIG. **12**) are displayed on the touch panel display **72** of the tablet terminal **32** has been explained, the technology of the present disclosure is not limited to this, and various screens may be displayed on the display **48** of the information processing apparatus **30**. In this case, the tablet side processing may be performed by the information processing apparatus **30**.

(341) In the above-described embodiment, although an example of the embodiment in which the instruction for the main imaging is received by the imaging instruction reception region **186**A has been explained, the technology of the present disclosure is not limited to this, and the instruction for the main imaging may also be received by the release button **146**. In this case, for example, the release button **146** is locked in advance so that the lock state of the release button **146** is released at a timing at which the imaging instruction reception region **186**A is displayed. In order to release the lock state of the release button **146** at the timing at which the imaging instruction reception region **186**A is displayed, in the information processing apparatus **30**, the determination unit **62**B determines whether or not an imaging permission signal has been stored in the RAM **66**. In a case in which the determination unit **62**B determines that the imaging permission signal has been stored in the RAM **66**, the imaging apparatus control unit **62**C transmits an unlock instruction signal for releasing the lock state of the release button **146** to the imaging apparatus **34**. In the imaging apparatus **34**, in a case in which the unlock instruction signal is received by the reception unit **132**A, the imaging system control unit **132**B releases the lock state of the release button **146**. Accordingly, it is possible to prevent the release button **146** from being erroneously operated at a timing at which it is better not to operate the release button **146**, and to operate the release button **146** at a timing at which it is permissible to operate the release button **146**.

(342) In the above-described embodiment, although the adjustment value according to the adjustment instruction given to the imaging condition adjustment screen **182** via the touch panel display **72** is calculated by the adjustment value calculation unit **78**F, the technology of the present disclosure is not limited to this, and the adjustment value may be calculated directly from the misregistration amount of the imaging range, the insufficient zoom magnification, and the difference angle without using the adjustment instruction. In this case, for example, the adjustment value may be calculated from a calculation expression in which the misregistration amount, the insufficient zoom magnification, and/or the difference angle are set as independent variables, and the adjustment value is a dependent variable, or the adjustment value may be derived from a table in which the misregistration amount, the insufficient zoom magnification, and/or the difference angle are set as input and the adjustment value is set as output. Then, in the manner explained in the above-described embodiment, the imageable signal may be set on condition that the misregistration amount, the insufficient zoom magnification, and the difference angle are adjusted according to the adjustment value, by the processor **62**. Even if the imageable signal is set in this way, the imaging instruction reception region **186**A is displayed on the imaging permission screen **186** as in the above-described embodiment.

(343) In the above-described embodiment, although an example of the embodiment in which the distance measurement is executed by the 3D sensor **38** has been explained, the technology of the present disclosure is not limited to this, and imaging and distance measurement may be selectively

executed by an image sensor comprising an image plane phase difference type photoelectric conversion element instead of the 3D sensor **38** or with the 3D sensor **38**. In this case, for example, instead of the image sensor **94**, an image sensor comprising an image plane phase difference type photoelectric conversion element in which a pair of photodiodes are provided for one pixel (hereinafter, also referred to as "image plane phase difference type image sensor") may be used.

(344) Each of the photosensitive pixels included in the photoelectric conversion element of the image plane phase difference type image sensor includes a pair of independent photodiodes. A first luminous flux obtained by performing pupil division of a luminous flux indicating a subject transmitted through the imaging lens **98** (hereinafter, also referred to as a "subject luminous flux") is incident on one photodiode of the pair of photodiodes, and a second luminous flux obtained by performing the pupil division of the subject luminous flux is incident on the other photodiode of the pair of photodiodes.

(345) All the photosensitive pixels included in the photoelectric conversion element of the image plane phase difference type image sensor have a function of outputting data related to the imaging and the phase difference. For example, in a case in which imaging is performed in an imaging mode, the photoelectric conversion element of the image plane phase difference type image sensor outputs non-phase difference pixel data by combining the pair of photodiodes into one pixel. For example, in a case in which distance measurement is performed in a distance measurement mode, the photoelectric conversion element of the image plane phase difference type image sensor outputs phase difference pixel data from each of the pair of photodiodes.

(346) In the photoelectric conversion element of the image plane phase difference type image sensor, the photosensitive pixels can selectively output the non-phase difference pixel data and the phase difference pixel data. The non-phase difference pixel data is pixel data obtained by performing photoelectric conversion by the entire region of the photosensitive pixels, and the phase difference pixel data is pixel data obtained by performing photoelectric conversion by a partial region of the photosensitive pixels. Here, the "entire region of the pixel" is a light-receiving region in which the pair of photodiodes are combined. In addition, the "partial region of the pixel" is a light-receiving region of the one photodiode of the pair of photodiodes or a light-receiving region of the other photodiode of the pair of photodiodes.

(347) The captured image **127** is generated based on the non-phase difference pixel data. The distance from the imaging apparatus **34** to the inspection object **16** is calculated based on the phase difference pixel data. That is, a distance to a real space point corresponding to each pixel is calculated based on the phase difference (that is, the misregistration amount and the misregistration direction) between the image based on a signal output from the one photodiode of the pair of photodiodes and an image based on a signal output from the other photodiode of the pair of photodiodes. The distance image **148** is generated based on the distance calculated for each pixel.

(348) The technology of the present disclosure is not limited to the feature that all the photosensitive pixels included in the photoelectric conversion element of the image plane phase difference type image sensor have the function of outputting data related to the imaging and the phase difference. That is, the photoelectric conversion element may include photosensitive pixels that do not have the function of outputting data related to the imaging and the phase difference. In addition, the photoelectric conversion element of the image sensor is not limited to the photoelectric conversion element of the image plane phase difference type in which a pair of photodiodes are provided in one pixel, and the photoelectric conversion element may be a photoelectric conversion element including a photosensitive pixel for imaging for acquiring the non-phase difference pixel data and a photosensitive pixel for phase difference detection for acquiring phase difference pixel data. In this case, the phase difference pixel is provided with a light shielding member to receive light on one of a first pupil portion region or a second pupil portion region.

(349) In the above-described embodiment, although an example of the embodiment in which the

inspection support processing program **172** is stored in the storage **64** has been explained, the technology of the present disclosure is not limited to this. For example, the inspection support processing program **172** may be stored in the portable storage medium **300** such as an SSD or a USB memory. The storage medium **300** is a non-transitory storage medium. The inspection support processing program **172** stored in the storage medium **300** is installed in the computer **44** of the information processing apparatus **30**. The processor **62** performs the inspection support processing in accordance with the inspection support processing program **172**.

(350) In addition, the inspection support processing program **172** may be stored in the storage device such as another computer or server device connected to the information processing apparatus **30** through a network, and the inspection support processing program **172** may be downloaded and installed in the computer **44** in response to a request from the information processing apparatus **30**.

(351) It is not necessary to store all of the inspection support processing program **172** in the storage device such as another computer or server device connected to the information processing apparatus **30** or in the storage **64**, but a part of the inspection support processing program **172** may be stored.

(352) In addition, although the computer **44** is built in the information processing apparatus **30** illustrated in FIG. **2**, the technology of the present disclosure is not limited to this, and for example, the computer **44** may be provided outside the information processing apparatus **30**.

(353) In the above-described embodiment, the computer **44** has been exemplified, but the technology of the present disclosure is not limited to this, and a device including an ASIC, an FPGA, and/or a PLD may be applied instead of the computer **44**. In addition, instead of the computer **44**, a combination of the hardware configuration and the software configuration may be used.

(354) As a hardware resource for performing the inspection support processing explained in the above-described embodiment, the following various processors can be used. Examples of the processors include a CPU that is a general-use processor executing software, that is, a program to function as a hardware resource that performs the inspection support processing. In addition, examples of the processor include a dedicated electric circuit which is a processor having a circuit configuration designed to be dedicated to performing specific processing, such as an FPGA, a PLD, or an ASIC. Each processor has a built-in or connected memory, and each processor uses the memory to perform inspection support processing.

(355) The hardware resource for performing the inspection support processing may be configured with one of various processors or may be configured with a combination of two or more processors (for example, a combination of a plurality of FPGAs or a combination of a CPU and an FPGA) of the same type or different types. In addition, the hardware resource for executing the inspection support processing may be one processor.

(356) As an example of configuring with one processor, first, one processor is configured with a combination of one or more CPUs and software, and there is an embodiment in which this processor functions as a hardware resource for executing the inspection support processing. Second, as represented by SoC or the like, there is an embodiment in which a processor that implements all functions of a system including a plurality of hardware resources for performing the inspection support processing with one IC chip is used. In this way, the inspection support processing is implemented using one or more of the above-described various processors as hardware resources.

(357) Further, as the hardware structure of these various processors, more specifically, an electric circuit in which circuit elements such as semiconductor elements are combined can be used. In addition, the above-described inspection support processing is merely an example. Therefore, needless to say, unnecessary steps may be deleted, new steps may be added, or the processing order may be changed without departing from the spirit and scope of the present disclosure.

(358) The above-described contents and the illustrated contents are the detailed explanations of the parts according to the technology of the present disclosure, and are merely examples of the technology of the present disclosure. For example, the above explanations related to configurations, functions, actions, and effects are explanations related to examples of configurations, functions, actions, and effects of the parts according to the technology of the present disclosure. Thus, it is needless to say that unnecessary portions may be deleted, new elements may be added, or replaced with respect to the above-described contents and the illustrated contents without departing from the spirit and scope of the technology of the present disclosure. In order to avoid complication and easily understand the part according to the technology of the present disclosure, in the above-described contents and the illustrated contents, the explanation of common general technical knowledge, which is not necessarily particularly required for implementing the technology of the present disclosure, is omitted.

(359) In the present specification, "A and/or B" is synonymous with "at least one of A or B". That is, "A and/or B" may refer to A alone, B alone, or a combination of A and B. In addition, in the present specification, in a case in which the connection of three or more matters is expressed by "and/or", the same concept as "A and/or B" is applied.

(360) In addition, all literatures, patent applications, and technical standards disclosed in the present specification are incorporated in the present specification by reference to the same extent as in a case in which each of the literatures, patent applications, and technical standards is specifically and individually indicated to be incorporated by reference.

Claims

1. An information processing apparatus comprising: a processor; and a memory connected to or built in the processor, wherein the processor acquires a live view image obtained by imaging an imaging scene by an imaging apparatus having a distance measurement function and a pre-captured image based on a main-captured image obtained by executing main imaging by the imaging apparatus, sets an imageable signal indicating that the main imaging is determined to be executable based on at least one of a distance measurement result obtained by the distance measurement function, or a captured image including the live view image among captured images obtained by imaging with the imaging apparatus or a captured image including still image obtained by imaging the imaging scene by the imaging apparatus at a timing corresponding to a timing of obtaining the live view image among captured images obtained by imaging with the imaging apparatus, and outputs screen data for displaying a screen including a live view region and a guide view region on a first display, the live view image is displayed in the live view region, the guide view region includes a wide view region and a guide region, the pre-captured image is displayed in the wide view region, guide information that is capable of specifying an image region corresponding to the live view image displayed in the live view region within the wide view region is displayed in the guide region, and the processor outputs the screen data as data in which the screen includes an imaging instruction reception region of a display aspect for notifying that the main imaging is executable, in a case in which the imageable signal is set, and outputs a main imaging instruction signal indicating an instruction to cause the imaging apparatus to execute the main imaging for the imaging scene indicated by the live view image, in a case in which an imaging instruction is received by the imaging instruction reception region.

2. The information processing apparatus according to claim 1, wherein the pre-captured image is an image indicating a scene wider than the imaging scene indicated by the live view image displayed in the live view region.

3. The information processing apparatus according to claim 2, wherein the pre-captured image is a composite image obtained by joining a plurality of the main-captured images into a panoramic image.

4. The information processing apparatus according to claim 3, wherein the screen includes a composite image confirmation view region in which the wide view region is enlarged together with the composite image.

5. The information processing apparatus according to claim 4, wherein the screen includes a real space area of an imaging region indicated by the composite image.

6. The information processing apparatus according to claim 1, wherein the processor outputs a distance measurement result acquisition instruction signal indicating an instruction to cause the imaging apparatus to acquire the distance measurement result.

7. The information processing apparatus according to claim 6, wherein the distance measurement result acquisition instruction signal includes a signal indicating an instruction to cause the imaging apparatus to measure a distance between a first imaging target, which is imaged by the imaging apparatus, and the imaging apparatus as one of the distance measurement results.

8. The information processing apparatus according to claim 1, wherein the imageable signal is generated on condition that an angle formed by a first imaging target surface imaged by the imaging apparatus and a predetermined surface included in the imaging apparatus is a facing angle at which the first imaging target surface and the imaging apparatus face each other.

9. The information processing apparatus according to claim 8, wherein the imaging apparatus has an image sensor, and the predetermined surface is a surface corresponding to an imaging surface of the image sensor.

10. The information processing apparatus according to claim 1, wherein the imageable signal is generated on condition that an overlap ratio between the pre-captured image and the main-captured image or the live view image is within a predetermined range.

11. The information processing apparatus according to claim 1, wherein the processor acquires information based on the distance measurement result.

12. The information processing apparatus according to claim 11, wherein the information based on the distance measurement result includes information indicating whether or not a second imaging target surface imaged by the imaging apparatus and the imaging apparatus face each other.

13. The information processing apparatus according to claim 11, wherein the information based on the distance measurement result includes information based on a distance between a second imaging target surface imaged by the imaging apparatus and the imaging apparatus.

14. The information processing apparatus according to claim 11, wherein the processor outputs distance measurement result data for causing a second display to display the information based on the distance measurement result.

15. The information processing apparatus according to claim 14, wherein the information based on the distance measurement result is displayed on the second display in a message format.

16. The information processing apparatus according to claim 1, wherein the imaging apparatus has a release button in a lock state, and the processor outputs an unlock instruction signal for causing the imaging apparatus to release the lock state, in a case in which the imageable signal is set.

17. An information processing system comprising: the information processing apparatus according to claim 1; and a reception device that receives an instruction given to the processor.

18. The information processing system according to claim 17, further comprising the imaging apparatus.

19. An information processing method comprising: acquiring a live view image obtained by imaging an imaging scene by an imaging apparatus having a distance measurement function and a pre-captured image based on a main-captured image obtained by executing main imaging by the imaging apparatus; setting an imageable signal indicating that the main imaging is determined to be executable based on at least one of a distance measurement result obtained by the distance measurement function, or a captured image including the live view image among captured images obtained by imaging with the imaging apparatus or a captured image including still image obtained by imaging the imaging scene by the imaging apparatus at a timing corresponding to a timing of

obtaining the live view image among captured images obtained by imaging with the imaging apparatus; and outputting screen data for displaying a screen including a live view region and a guide view region on a first display, wherein the live view image is displayed in the live view region, the guide view region includes a wide view region and a guide region, the pre-captured image is displayed in the wide view region, guide information that is capable of specifying an image region corresponding to the live view image displayed in the live view region within the wide view region is displayed in the guide region, and the information processing method further comprises outputting the screen data as data in which the screen includes an imaging instruction reception region of a display aspect for notifying that the main imaging is executable, in a case in which the imageable signal is set, and outputting a main imaging instruction signal indicating an instruction to cause the imaging apparatus to execute the main imaging for the imaging scene indicated by the live view image, in a case in which an imaging instruction is received by the imaging instruction reception region.

20. A non-transitory computer-readable storage medium storing a program executable by a computer to perform a process comprising: acquiring a live view image obtained by imaging an imaging scene by an imaging apparatus having a distance measurement function and a pre-captured image based on a main-captured image obtained by executing main imaging by the imaging apparatus; setting an imageable signal indicating that the main imaging is determined to be executable based on at least one of a distance measurement result obtained by the distance measurement function, or a captured image including the live view image among captured images obtained by imaging with the imaging apparatus or a captured image including still image obtained by imaging the imaging scene by the imaging apparatus at a timing corresponding to a timing of obtaining the live view image among captured images obtained by imaging with the imaging apparatus; and outputting screen data for displaying a screen including a live view region and a guide view region on a first display, wherein the live view image is displayed in the live view region, the guide view region includes a wide view region and a guide region, the pre-captured image is displayed in the wide view region, guide information that is capable of specifying an image region corresponding to the live view image displayed in the live view region within the wide view region is displayed in the guide region, and the process further comprises outputting the screen data as data in which the screen includes an imaging instruction reception region of a display aspect for notifying that the main imaging is executable, in a case in which the imageable signal is set, and outputting a main imaging instruction signal indicating an instruction to cause the imaging apparatus to execute the main imaging for the imaging scene indicated by the live view image, in a case in which an imaging instruction is received by the imaging instruction reception region.