using the mark, the virtual information may not be superimposed and displayed when the mark does not exist, and the virtual information may not be shared among a plurality of users.

Embodiments of t~~T~~he present invention ~~is made in view of the above-described issue, and aims to~~ provide a novel and modified information processing apparatus, an information processing method, a program, and an information processing system, which enable a virtual space to be shared by other apparatuses by detecting the position information of the other apparatuses.

Solution to Problem

[0005]

~~According to an aspect of the present invention, in order to achieve the above-described object, there is provided an information processing apparatus including: an image acquisition unit for acquiring a real space image including an image of another apparatus; a coordinate system generation unit for generating a spatial coordinate system of the real space image acquired by the image acquisition unit; and a transmission unit for transmitting spatial information constituting the spatial coordinate system generated by the coordinate system generation unit to the other apparatus sharing the spatial coordinate system.~~

According to a first aspect, there is provided an information processing apparatus comprising: an image acquisition unit for acquiring a real space image including an image of another apparatus; a coordinate system generation unit for generating a spatial coordinate system of the real space image acquired by the image acquisition unit; and a transmission unit for transmitting spatial information constituting the spatial coordinate system generated by the coordinate system generation unit to the other apparatus sharing the spatial coordinate system; and an acquisition unit for acquiring the spatial coordinate of the other apparatus, a spatial coordinate of its own apparatus, and an angle of a vector connecting the spatial coordinate of the other apparatus to the spatial coordinate of its own apparatus, wherein the transmission unit transmits the other spatial coordinate, the spatial coordinate of its own apparatus, and the angle of the vector to the other apparatus as

the spatial information.

[0006]

TFurthermore, the information processing apparatus may includes an acquisition unit for acquiring a spatial coordinate of the other apparatus, a spatial coordinate of its own apparatus, and an angle of a vector connecting the spatial coordinate of the other apparatus to the spatial coordinate of its own apparatus, and the transmission unit may transmit the other spatial coordinate, the spatial coordinate of its own apparatus, and the angle of the vector to the other apparatus as the spatial information.

[0007]

Furthermore, the acquisition unit may acquire a rotation angle of the spatial coordinate system from the angle of the vector connecting the spatial coordinate of the other apparatus to the spatial coordinate of its own apparatus, and the

which is shared by the information processing apparatus, based on the spatial information transmitted from the transmission unit.

[0013]

Furthermore, when the acquisition unit acquires the spatial information constituting a spatial coordinate system generated by the other apparatus, the coordinate system generation unit may generate the spatial coordinate system based on the spatial information acquired from the other apparatus.

[0014]

~~According to another aspect of the present invention in order to achieve the above-described object, there is provided an information processing method for allowing one information processing apparatus to perform the steps of: acquiring a real space image; generating a spatial coordinate system of the real space image acquired by the image acquisition unit; transmitting spatial information constituting the spatial coordinate system generated by the coordinate system generation unit to the other apparatus sharing the spatial coordinate system; and generating the spatial coordinate system by the other apparatus having received the spatial information based on the spatial information, the spatial coordinate system being shared by the information processing apparatus.~~

According to a second aspect, there is provided an information processing method performed by one information processing apparatus, comprising the steps of: acquiring a real space image; generating a spatial coordinate system of the real space image acquired by the image acquisition unit; transmitting spatial information constituting the spatial coordinate system generated by the coordinate system generation unit to the other apparatus sharing the spatial coordinate system; generating, by the other apparatus having received the spatial information, the spatial coordinate system based on the spatial information, the spatial coordinate system being shared by the information processing apparatus; acquiring the spatial coordinate of the other apparatus, a spatial coordinate of its own apparatus, and an angle of a vector connecting the spatial coordinate of the other apparatus to the spatial coordinate of its own apparatus; and transmitting the other spatial coordinate, the spatial coordinate of its own apparatus, and the angle of the vector to the other

apparatus as the spatial information.

[0015]

~~According to another aspect of the present invention in order to achieve the above-described object, there is provided a program for allowing a computer to serve as an information processing apparatus, wherein the information processing apparatus includes: an image acquisition unit for acquiring a real space image; a coordinate system generation unit for generating a spatial coordinate system of the real space image acquired by the image acquisition unit; and a transmission unit for transmitting spatial information constituting the spatial coordinate system generated by the coordinate system generation unit to the other apparatus sharing the spatial coordinate system.~~

According to a third aspect, there is provided a program for causing a computer to serve as an information processing apparatus, wherein the information processing apparatus comprises: an image acquisition unit for acquiring a real space image; a coordinate system generation unit for generating a spatial coordinate system of the real space image acquired by the image acquisition unit; a transmission unit for transmitting spatial information constituting the spatial coordinate system generated by the coordinate system generation unit to the other apparatus sharing the spatial coordinate system; and an acquisition unit for acquiring the spatial coordinate of the other apparatus, a spatial coordinate of its own apparatus, and an angle of a vector connecting the spatial coordinate of the other apparatus to the spatial coordinate of its own apparatus, wherein the transmission unit transmits the other spatial coordinate, the spatial coordinate of its own apparatus, and the angle of the vector to the other apparatus as the spatial information.

[0016]

~~According to another aspect of the present invention in order to achieve the above-described object, there is provided an information processing system including~~

~~one information processing apparatus, wherein the one information processing apparatus includes: an image acquisition unit for acquiring a real space image; a coordinate system generation unit for generating a spatial coordinate system of the real space image acquired by the image acquisition unit; and a transmission unit for transmitting spatial information constituting the spatial coordinate system generated by the coordinate system generation unit to another apparatus sharing the spatial coordinate system, wherein the other apparatus connected to the one information processing apparatus through a network includes a coordinate system generation unit for generating the spatial coordinate system, which is shared by the information processing apparatus, based on the spatial information transmitted from the transmission unit, and the spatial information includes a spatial coordinate of the other apparatus, a spatial coordinate of its own apparatus, and an angle of a vector connecting the spatial coordinate of the other apparatus to the spatial coordinate of its own apparatus.~~

According to a fourth aspect, there is provided an information processing system, wherein one information processing apparatus comprises: an image acquisition unit for acquiring a real space image including an image of another apparatus; a coordinate system generation unit for generating a spatial coordinate system of the real space image acquired by the image acquisition unit; a transmission unit for transmitting spatial information constituting the spatial coordinate system generated by the coordinate system generation unit to the other apparatus sharing the spatial coordinate system; and an acquisition unit for acquiring the spatial information, wherein the spatial information includes a spatial coordinate of the other apparatus, a spatial coordinate of its own apparatus, and an angle of a vector connecting the spatial coordinate of the other apparatus to the spatial coordinate of its own apparatus, wherein the transmission unit transmits the other spatial coordinate, the spatial coordinate of its own apparatus, and the angle of the vector to the other apparatus as the spatial information, and wherein the other apparatus connected to the information processing apparatus through a network includes a coordinate system generation unit for generating the spatial coordinate system, which is shared by the information processing apparatus, based on the spatial information transmitted from

the transmission unit.

Advantageous Effects of Invention

[0017]

According to embodiments of the present invention as described above, spatial information is shared among a plurality of apparatuses, so that it is possible to display virtual information suitable for the position and posture of each apparatus.

Brief Description of Drawings

[0018]

[Fig. 1] Fig. 1 is a diagram for explaining an outline of an information processing system according to an embodiment of the present invention.

[Fig. 2] Fig. 2 is a diagram for explaining the outline of the information processing system according to the same embodiment.

[Fig. 3] Fig. 3 is a block diagram showing a hardware configuration of the information processing apparatus according to the same embodiment.

[Fig. 4] Fig. 4 is a block diagram showing a functional configuration of an information processing apparatus according to a first embodiment of the present