Claims

1. An imaging system comprising:

image capture apparatus for capturing an image of an operator work site, the image including depth information; and

display apparatus in communication with the image capture apparatus, the display apparatus comprising at least one display screen and being arranged to receive the image captured by the image capture apparatus, including the depth information, and display to the operator the image captured by the image capture apparatus, including the depth information, on the display screen;

wherein the display screen is located between the operator's eyes and the position of the work site; and

wherein the imaging system has real- time information of the position of one or both of the operator's eyes, which real-time information is obtained by a tracking device worn by the operator.

2. An imaging system according to claim 1, wherein the image capture apparatus comprises a camera capable of obtaining depth information.

3. An imaging system according to claim 1, wherein the image capture apparatus comprises a plurality of cameras, and the depth information is obtained by comparing images captured by the plurality of cameras.

4. An imaging system according to any preceding claim, wherein the depth information is conveyed to the operator by management of the views delivered to each of the operator's eyes.

~~5. An imaging system according to any preceding claim, wherein the imaging system has real- time information of the position of one or both of the operator's eyes.~~

~~6. An imaging system according to claim 5, wherein the real-time information specifying the position of one or both of the operator's eyes is obtained by a tracking device worn by the operator.~~

~~7~~5. An imaging system according to claim ~~5 or claim 6~~1, wherein the real-time information specifying the position of one or both of the operator's eyes is obtained by one or more cameras mounted on the imaging system together with analysis to locate the positions of the operator's eyes.

~~8~~6. An imaging system according to any of claim~~s~~ 1 or ~~5 to 7~~, wherein the real-time information specifying the position of one or both of the operator's eyes is used to control zoom of all or part of the displayed image.

~~9~~7. An imaging system according to any preceding claim, wherein the depth information is conveyed to the operator by parallax as the operator's head moves.

~~10~~8. An imaging system according to any preceding claim, wherein the image capture apparatus comprises sensors for obtaining the image by detecting light in or in and around the visible range.

~~11~~9. An imaging system according to any preceding claim, wherein the image capture apparatus comprises sensors for obtaining the image by detecting radiated or transmitted infrared radiation.

~~12~~10. An imaging system according to any preceding claim, wherein the image capture apparatus comprises ultrasound emitters and sensors, and the display apparatus is enabled to display the image on the display screen, such that the work site appears to the operator to be at a location substantially corresponding to the position of the work site.

~~13~~11. An imaging system according to any preceding claim, wherein the image capture apparatus is arranged to obtain the image by magnetic resonance imaging (MRI).

~~14~~12. An imaging system according to any preceding claim, wherein images obtained by at least two modesare combined to form the image displayed to the operator on the

display screen, the two modes being from a set including but not limited to visible light, magnetic resonance, ultrasound and infrared radiation.

~~15~~13. An imaging system according to any preceding claim, wherein the display screen is arranged to display supplemental images.

~~16~~14. An imaging system according to any preceding claim, wherein detected positions of a tool or tools controlled by the operator or operators provide input to the imaging system.

~~17~~15. A method for capturing and displaying an image of an operator work site, the method comprising the steps of:

capturing the image of the operator work site, the image including depth information;

communicating the captured image, including the depth information, to display apparatus comprising a display screen; and

displaying to the operator the captured image, including the depth information, on the display screen located between the operator's eyes and the position of the work site.

~~18~~16. A method according to claim ~~17~~5, wherein the step of capturing the image comprises obtaining the depth information by a camera capable of obtaining depth information.

~~19~~17. An imaging system comprising:

a display screen for displaying an image to an operator;

means to obtain real-time information specifying the position of one or both of the operator's eyes; and

means to use changes in the position of the operator's eyes to control magnification of all or part of the displayed image.

~~20~~18. An imaging system according to claim ~~19~~17, wherein the display screen shows images stereographically, by showing different images to each of the operator's eyes.

2119. An imaging system according to claim 1917, wherein the display screen shows images with parallax, by adjusting the image according to the position of the operator's eyes.

2220. An imaging system comprising:

motion capture apparatusfor capturing motion of manipulated tools; and

display apparatus in communication with the motion capture apparatus, the display apparatus comprising at least one display screen and being arranged to receive the motion data captured by the motion capture apparatus, and display to an operator the motion captured by the motion capture apparatus, in the form of images on the display screen;

wherein the display apparatus is further arranged to display additional images on the display screen; and

wherein the display screen is located between the operator's eyes and the position of an operator work site.

2321. An imaging system according to claim 2220, wherein the additional images comprise images of a recorded procedure performed on real or virtual objects by another operator.

2422. An imaging system comprising:

a hand-held device comprising

a camera on a first side for capturing an image of an operator work site, the image including depth information; and

a display screen on a second side opposite the first side, for displaying to the operator the image captured by the camera, including the depth information; and

support means for positioning the hand-held device between the operator's eyes and the position of the work site.

2523. An imaging system according to claim 2422, wherein the camera of the hand-held device comprises a camera capable of obtaining depth information.

2624. An imaging system comprising:

image capture apparatus for capturing an image of a subject, for detecting light in or in and around the visible range, and classifying the captured light into more than three frequency bands; and

computing means for determining from the captured image, the spectral reflectivities of the subject and the lighting conditions when the image was captured, and for producing a further image, in the more than three frequency bands, of the subject in user-specified lighting conditions.