CLAIMS

1. A display apparatus comprising:

- at least one context image projector or at least one context display for rendering a context image, wherein an angular width of a projection of the rendered context image ranges from 40 degrees to 220 degrees; and

- at least one focus image projector for rendering a focus image, wherein an angular width of a projection of the rendered focus image ranges from 5 degrees to 60 degrees;

- at least one projection surface;

- an image steering unit;

- means for detecting a gaze direction; and

- a processor coupled in communication with the image steering unit and the means for detecting the gaze direction, wherein the processor is configured to:

(a) receive an input image, and use the detected gaze direction to determine a region of visual accuracy of the input image;

(b) process the input image to generate the context image and the focus image, the context image having a first resolution and the focus image having a second resolution, wherein:

- a region of the context image that substantially corresponds to the region of visual accuracy of the input image is masked,

- the focus image substantially corresponds to the region of visual accuracy of the input image, and

- the second resolution is higher than the first resolution;

(c) render the context image at the at least one context display or at the at least one projection surface via the at least one context image projector;

(d) render the focus image at the at least one projection surface via the at least one focus image projector; and

(e) control the image steering unit to adjust a location of the projection of the rendered focus image on the at least one projection surface, such that the projection of the rendered focus image substantially overlaps the projection of the masked region of the rendered context image on the at least one projection surface,

wherein the processor is configured to perform (c), (d) and (e) substantially simultaneously, and an arrangement is made to combine the projection of the rendered focus image with the projection of the rendered context image to create a visual scene.

2. The display apparatus of claim 1, wherein the at least one focus image projector comprises at least two focus image projectors, at least one of the at least two focus image projectors being arranged to be used for a left eye of a user, and at least one of the at least two focus image projectors being arranged to be used for a right eye of the user.

3. The display apparatus of claim 1, wherein the at least one context image projector comprises at least two context image projectors, at least one of the at least two context image projectors being arranged to be used for a left eye of a user, and at least one of the at least two context image projectors being arranged to be used for a right eye of the user.

4. The display apparatus of claim 1, wherein the at least one context image projector is arranged to be used for left and right eyes of a user on a shared-basis.

5. The display apparatus of claim 1, wherein the at least one projection surface comprises at least two projection surfaces, at least one of the at least two projection surfaces being arranged to be used for a left eye of a user, and at least one of the at least two projection surfaces being arranged to be used for a right eye of the user.

6. The display apparatus of claim 1, wherein the at least one projection surface is implemented as a part of the at least one context display.

7. The display apparatus of claim 1, wherein the at least one projection surface is implemented by way of at least one of: a polarizer, a retarder, an optical film.

8. The display apparatus of claim 1, wherein the image steering unit comprises at least one first actuator for moving the focus image projector with respect to the at least one projection surface, wherein the processor is configured to control the at least one first actuator to adjust the location of the projection of the rendered focus image on the at least one projection surface.

9. The display apparatus of claim 1, wherein the image steering unit comprises:

- at least one optical element that is positioned on an optical path between the at least one projection surface and the at least one focus image projector, the at least one optical element being selected from the group consisting of a lens, a prism, a mirror, a beam splitter, and an optical waveguide; and
- at least one second actuator for moving the at least one optical element with respect to the at least one focus image projector,

wherein the processor is configured to control the at least one second actuator to adjust the location of the projection of the rendered focus image on the at least one projection surface.

10. The display apparatus of claim 1, wherein the image steering unit comprises at least one third actuator for moving the at least one projection surface, wherein the processor is configured to control the at least one third actuator to adjust the location of the projection of the rendered focus image on the at least one projection surface.

11. The display apparatus of claim 1, wherein the display apparatus comprises:

- at least one focusing lens that is positioned on an optical path between the at least one projection surface and the at least one focus image projector; and
- at least one fourth actuator for moving the at least one focusing lens with respect to the at least one focus image projector,

wherein the processor is configured to control the at least one fourth actuator to adjust a focus of the projection of the rendered focus image.

12. The display apparatus of claim 2, wherein the display apparatus comprises:

- at least one focusing lens that is positioned on an optical path between the at least one first optical element and the at least one focus display,

wherein the processor is configured to control at least one active optical characteristic of the at least one focusing lens by applying a control signal to the at least one focusing lens.

13. The display apparatus of claim 1, wherein the context display is selected from the group consisting of: a Liquid Crystal Display, a Light Emitting Diode-based display, an Organic Light Emitting Diode-based display, a micro Organic Light Emitting Diode-based display, and a Liquid Crystal on Silicon-based display.

14. The display apparatus of claim 1, wherein the context image projector and/or the focus image projector are independently selected from the group consisting of: a Liquid Crystal Display-based projector, a Light Emitting Diode-based projector, an Organic Light Emitting Diode-based projector, a Liquid Crystal on Silicon-based projector, a Digital Light Processing-based projector, and a laser projector.

15. A method of displaying, via a display apparatus comprising at least one context image projector or at least one context display, and at least one focus image projector, the method comprising:

(i) rendering a context image via the at least one context image projector or the at least one context display, wherein an angular width of a projection of the rendered context image ranges from 40 degrees to 220 degrees;

(ii) rendering a focus image via the at least one focus image projector, wherein an angular width of a projection of the rendered focus image ranges from 5 degrees to 60 degrees; and

(iii) arranging for the projection of the rendered focus image to be combined with the projection of the rendered context image to create a visual scene; and

wherein the display apparatus further comprises at least one projection surface, an image steering unit and a means for detecting a gaze direction, and wherein the method further comprises:

(iv) detecting a gaze direction, and using the detected gaze direction to determine a region of visual accuracy of an input image;

(v) processing the input image to generate the context image and the focus image, the context image having a first resolution and the focus image having a second resolution, the second resolution being higher than the first resolution, wherein the processing comprises:

- masking a region of the context image that substantially corresponds to the region of visual accuracy of the input image; and
- generating the focus image to substantially correspond to the region of visual accuracy of the input image; and

(vi) controlling the image steering unit to adjust a location of the projection of the rendered focus image on the at least one projection surface, such that the projection of the rendered focus image

substantially overlaps the projection of the masked region of the rendered context image on the at least one projection surface,
wherein (i), (ii) and (vi) are performed substantially simultaneously.

16. The method of claim 15, wherein the location of the projection of the rendered focus image is adjusted by controlling at least one first actuator of the image steering unit to move the focus image projector with respect to the at least one projection surface.

17. The method of claim 15, wherein the location of the projection of the rendered focus image is adjusted by controlling at least one second actuator of the image steering unit to move at least one optical element of the image steering unit with respect to the at least one focus image projector, wherein the at least one optical element is positioned on an optical path between the at least one projection surface and the at least one focus image projector, and/or the location of the projection of the rendered focus image is adjusted by controlling at least one third actuator of the image steering unit to move the at least one projection surface.

18. The method of claim 15, further comprising adjusting a focus of the projection of the rendered focus image by controlling at least one fourth actuator of the display apparatus to move at least one focusing lens of the display apparatus with respect to the at least one focus image projector, wherein the at least one focusing lens is positioned on an optical path between the at least one projection surface and the at least one focus image projector.