CLAIMS

1. A display apparatus comprising:

- 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, the at least one context display comprising at least one projection surface;

- 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;

- 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;

(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,

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 context display comprises a multi-layered structure, and wherein the at least one projection surface is implemented by way of at least one layer of the multi-layered structure.

3. The display apparatus of claim 1, wherein the at least one projection surface is implemented by way of an optical coating on a front side of the at least one context display or on a back side of the at least one context display.

4. The display apparatus of claim 1, wherein the at least one projection surface is implemented by way of a polarizer or a retarder.

5. The display apparatus of claim 1, wherein the at least one context display comprises a layer having a pixel layout that allows the projection of the rendered focus image to pass through substantially.

6. The display apparatus of claim 5, wherein the pixel layout comprises a plurality of pixels that are arranged in a manner that semi-transparent regions are formed between neighboring pixels.

7. The display apparatus of claim 1, wherein the at least one context display comprises at least one layer having optical waveguides for allowing the projection of the rendered focus image to pass through substantially.

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, and a beam splitter; 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 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.

13. The display apparatus of claim 1, wherein the focus image projector is 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.

14. A method of displaying, via a display apparatus comprising at least one context display, and at least one focus image projector, an image steering unit, means for detecting a gaze direction, the at least one context display comprising at least one projection surface, the method comprising:

(i) rendering a context image via 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;

(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;

wherein the display apparatus further comprises 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, 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,

wherein (i), (ii) and (vi) are performed substantially simultaneously.

15. The method of claim 14, 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.

16. The method of claim 14, 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.

17. The method of claim 14, wherein 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 14, 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.