CLAIMS

1. A method of maintaining occupant awareness in a vehicle, the method comprising:

determining, by one or more processors, a location at which an occupant within the vehicle is gazing;

generating, by the one or more processors and when the determined location indicates that the occupant is not gazing in a direction in which the vehicle is traveling, one or more contextual images visualizing a context in which the vehicle is currently operating; and

presenting, by a display and based on the determined location, the one or more contextual images at a location within the vehicle.

2. The method of claim 1, wherein the vehicle comprises the one or more processors, wherein the one or more processors are further configured to autonomously control operation of the vehicle when determining the location and generating the one or more contextual images.

3. The method of claim 2, wherein presenting the one or more contextual images comprises presenting the one or more contextual images proximate to or overlapping, at least in part, with the determined location to assist the occupant in maintaining awareness of the context in the event control of the vehicle is transferred from the vehicle to the occupant.

4. The method of claim 1, wherein determining the location at which the occupant is gazing comprises performing eye tracking.

5. The method of claim 1, wherein a head mounted display comprises at least one of the one or more processors and the display.

6. The method of claim 1, wherein the vehicle includes at least one of the one or more processors and the display.

7. The method of claim 1,

wherein the occupant is wearing a head mounted display, the head mounted display including the display that presents the one or more contextual images, and

wherein the vehicle includes a processor of the one or more processors.

8. The method of claim 1, wherein the display comprises a projector.

9. The method of claim 1, wherein the display comprises an active display.

10. The method of claim 1, further comprising:

determining a transparency for the one or more contextual images based on content of a scene shown in the one or more contextual images.

11. The method of claim 10, wherein determining the transparency comprises:

performing a visual analysis of the one or more contextual images to identify an object of the scene shown in the one or more contextual images;

determining an alert level of the object to the vehicle; and

determining the transparency based on the determined alert level.

12. The method of claim 1, wherein the one or more contextual images comprise one of images taken along the direction of travel of the vehicle, or images of a top-down plan view of the vehicle and surrounding objects.

13. The method of claim 1, further comprising augmenting the one or more contextual images to include a virtual object that is associated with a condition in a scene shown in the one or more contextual images or a condition pertinent to operation of the vehicle.

14. The method of claim 13,

wherein the conditions include at least one of another vehicle detected to be closing toward the vehicle at a rate above a threshold rate, another vehicle communicating a hazard, another vehicle swerving in a lane above a threshold swerve amount, and another vehicle of one or more dark colors or low contrast, and

wherein the method further comprises:

determining a visual emphasis score based on the context in which the vehicle is currently operating; and

adjusting the virtual object based on the visual emphasis score.

15. The method of claim 1, further comprising augmenting the one or more contextual images to include a virtual object that emphasizes an object, wherein the object comprises one of a lane marker, a pedestrian, or another vehicle.

16. The method of claim 15, further comprising:

determining a visual emphasis score based on the context in which the vehicle is currently operating; and

adjusting the virtual object based on the visual emphasis score.

17. A device configured to maintain occupant awareness in a vehicle, the device comprising:

one or more processors configured to:

determine a location at which an occupant is gazing; and

generate, when the determined location indicates that the occupant is not gazing in a direction in which the vehicle is traveling, one or more contextual images visualizing a context in which the vehicle is currently operating; and

cause a display to present, based on the determined location, the one or more contextual images proximate to the determined position within the cabin of the vehicle.

18. The device of claim 17, wherein the vehicle comprises the one or more processors, wherein the one or more processors are further configured to autonomously control operation of the vehicle when determining the location and generating the one or more contextual images.

19. The device of claim 18, wherein the display is caused to present the one or more contextual images proximate to or overlapping, at least in part, with the determined location to assist the occupant in maintaining awareness of the context in the event control of the vehicle is transferred from the vehicle to the occupant.

20. The device of claim 17, wherein the one or more processors perform eye tracking.

21. The device of claim 17, wherein at least one of the one or more processors and the display are included in a head mounted display.

22. The device of claim 17, wherein the vehicle includes at least one of the one or more processors and the display.

23. The device of claim 17,

wherein a head mounted display includes the display, and

wherein the vehicle includes a processor of the one or more processors.

24. The device of claim 17,

wherein the display comprises a projector that projects the one or more contextual images proximate to the determined location.

25. The device of claim 17, wherein the display comprises an active display having at least a portion of the active display overlapping with or adjacent to the determined location.

26. The device of claim 17, wherein the one or more processors are further configured to:

determine a transparency for the one or more contextual images based on content of a scene shown in the one or more contextual images.

27. The device of claim 17, wherein the one or more processors are further configured to:

determine a visual emphasis score based on the context in which the vehicle is currently operating; and

adjust, based on the visual emphasis score, a virtual object that is associated with a condition in the scene or a condition pertinent to operation of the vehicle; and

augment the one or more contextual images to include the virtual object.

28. The device of claim 17, wherein the one or more processors are further configured to:

augment the one or more contextual images to include a virtual object that emphasizes an object, wherein the object comprises one of a lane marker, a pedestrian, or another vehicle.

29. A device configured to maintain occupant awareness in a vehicle, the device comprising:

means for determining a location at which an occupant within the vehicle is gazing;

means for generating, when the determined location indicates that the occupant is not gazing in a direction in which the vehicle is traveling, one or more contextual images visualizing a context in which the vehicle is currently operating; and

means for presenting, based on the determined location, the one or more contextual images at a location within the vehicle.

30. A non-transitory computer-readable storage medium having stored thereon instructions that, when executed, cause one or more processors to:

determine a location at which an occupant within a vehicle is gazing;

generate, when the determined location indicates that the occupant is not gazing in a direction in which the vehicle is traveling, one or more contextual images visualizing a context in which the vehicle is currently operating; and

interface with a display to present, based on the determined location, the one or more contextual images at a location within the vehicle.