CLAIMS:

1. A portable electronic device for a mixed reality, MR, headset including a lens through which a user wearing the MR headset can view real-world features and including a holder configured to retain the portable electronic device in a defined orientation relative to the lens, the portable electronic device comprising: a camera configured to output video frames and arranged by the holder to view at least a portion of the lens of the MR headset; a display device arranged to display information that is projected on the lens for reflection directly or indirectly toward the user's eyes and the camera of the MR headset; a processor operationally connected to the camera and to the display device, and configured to perform operations comprising: processing the video frames from the camera to identify locations of at least one real-world feature; displaying information at locations on the display device; and controlling at least one of the processing of the video frames to identify locations of at least one real-world feature and the displaying of the information on the display device, to at least partially reduce occurrence in the video frames of the information that is displayed by the display device, wherein the controlling of the processing of the video frames comprises controlling the processing of the video frames to identify locations of at least one real-world feature to occur during second time durations while the information is not displayed on the display device and further controlling the processing of the video frames to identify locations of at least one real-world feature to not occur during first time durations while the information is displayed on the display device, and wherein the controlling of the displaying of the information on the display device comprises controlling the displaying of the information on the display device during the first time durations to occur while the processing is not performed on the video frames to identify locations of at least one real-world feature and further controlling the ceasing of the displaying of the information on the display device during the second time durations to occur while the processing is being performed on the video frames to identify locations of at least one real-world feature.

2. The portable electronic device of claim 1, wherein the operations further comprise: determining an amount of overlap occurring between: 1) the information that is displayed by the display device and occurring in the video frames from the camera; and 2) the locations of the real-world feature that are identified by processing of the video frames from the camera; and initiating the controlling of at least one of the processing of the video frames to identify locations of at least one real-world feature to occur during the second time durations and the

displaying of the information on the display device to occur during the first time durations, based on the amount of overlap satisfying a defined rule.

3. The portable electronic device of claim 1, wherein the operations further comprise: displaying a calibration pattern on the display device; processing the video frames to determine a region of the video frames containing the graphical pattern; ceasing display of the calibration pattern on the display device; following cessation of display of the calibration pattern, processing the video frames to determine when a location of the real-world feature enters the region of the video frames; and responsive to the location of the real-world feature entering the region of the video frames, initiating the controlling of at least one of the processing of the video frames to identify locations of at least one real-world feature to occur during the second time durations and the displaying of the information on the display device to occur during the first time durations.

4. The portable electronic device of claim 1, wherein the operations to control at least one of the processing of the video frames and the displaying of the information on the display device, further comprise: determining when a display quality prioritization rule is satisfied; and responsive to the display quality prioritization rule becoming satisfied, controlling the displaying of the information on the display device to increase a frequency at which the display device is repetitively refreshed to display the information during the first time durations to occur while the processing is not performed on the video frames to identify locations of at least one real-world feature, and/or controlling the processing of the video frames to identify locations of at least one real-world feature to decrease a frequency at which the video frames from the camera are processed to identify locations of the real-world feature during the second time durations while the information is not displayed on the display device.

5. The portable electronic device of claim 1, wherein the operations to control at least one of the processing of the video frames and the displaying of the information on the display device, further comprise: determining when a camera video prioritization rule is satisfied; and responsive to the camera video prioritization rule becoming satisfied, controlling the displaying of the information on the display device to decrease a frequency at which the display device is repetitively refreshed to display the information during the first time durations to occur while the processing is not performed on the video frames to identify locations of at least one real-world feature, and/or controlling the processing of the video

frames to identify locations of at least one real-world feature to increase a frequency at which the video frames from the camera are processed to identify locations of the real-world feature during the second time durations while the information is not displayed on the display device.

6. The portable electronic device of claim 1, wherein the operations to further comprise: determining when a display quality prioritization rule is satisfied; and responsive to the display quality prioritization rule becoming satisfied, increasing a duty cycle of the second time duration during which the display device is repetitively refreshed to display the information relative to the first time duration during which the display device is repetitively refreshed not displaying the information.

7. The portable electronic device of claim 1, wherein the operations further comprise: determining when a camera video prioritization rule is satisfied; and responsive to the camera video prioritization rule becoming satisfied, decreasing a duty cycle of the second time duration during which the display device is repetitively refreshed to display the information relative to the first time duration during which the display device is repetitively refreshed not displaying the information.

8. The portable electronic device of claim 1, wherein: the operations further comprise processing the video frames from the camera to identify a region of the display device that displays a portion of information which occurs in the video frames at least partially overlapping a location of the real-world feature, and the operations to control at least one of the processing of the video frames and the displaying of the information on the display device, further comprise: repetitively alternating between displaying the portion of the information within the region of the display device and ceasing display of the portion of the information within the region of the display device, wherein the processing of the video frames is controlled to occur during the first time durations while the portion of the information is not displayed within the region of the display device and controlled to not occur during the second time durations while the portion of the information is displayed within the region of the display device.

9. The portable electronic device of claim 8, wherein the operations to repetitively alternate between displaying the portion of the information within the region of the display device and ceasing display of the portion of the information within the region of the display device,

further comprise: determining when a display quality prioritization rule is satisfied; and responsive to the display quality prioritization rule becoming satisfied, increasing a duty cycle of the second time duration during which the region of the display device is repetitively refreshed to display the portion of the information relative to the second time duration during which the region of the display device is repetitively refreshed not displaying the portion of the information.

10. The portable electronic device of claim 8, wherein the operations to repetitively alternate between displaying the portion of the information within the region of the display device and ceasing display of the portion of the information within the region of the display device, further comprise: determining when a camera video prioritization rule is satisfied; and responsive to the camera video prioritization rule becoming satisfied, decreasing a duty cycle of the second time duration during which the region of the display device is repetitively refreshed to display the portion of the information relative to the second time duration during which the region of the display device is repetitively refreshed not displaying the portion of the information.

11. The portable electronic device of claim 1, wherein: the operations further comprise processing the video frames from the camera to identify a region of the video frames that contains the information; and the operations to control at least one of the processing of the video frames and the displaying of the information on the display device, further comprise: processing the region of the video frames identified as containing the information at a lower frequency to identify locations of at least one real-world feature than another region of the video frames being processed to identify locations of at least one real-world feature that does not contain the information.

12. The portable electronic device of claim 1, wherein: the operations further comprise processing the video frames from the camera to identify a region of the display device that displays a portion of information and which at least partially overlaps a location of the real-world feature in the video frames, and the operations to control at least one of the processing of the video frames and the displaying of the information on the display device, further comprise: performing at least one of: decreasing brightness of the region of the display device; decreasing contrast of the region of the display device; determining a primary color of the real-world feature and selecting a color of the information that is displayed in the region

of the display device to differentiate from the primary color of the real-world feature.

13. The portable electronic device of claim 1, wherein: the operations further comprise processing the video frames from the camera to identify a region of the display device that displays a portion of information and which at least partially overlaps a location of the real-world feature in the video frames, and the operations to control at least one of the processing of the video frames and the displaying of the information on the display device, further comprise: performing at least one of: increasing brightness of another region of the display device that does not overlap a location of the real-world feature in the video frames; increasing contrast of the other region of the display device; and determining a primary color of the real-world feature and selecting a color of the information that is displayed in the other region of the display device to differentiate from the primary color of the real-world feature.

14. The portable electronic device of claim 1, wherein: the operations further comprise identifying a region of the display device at which the user's eyes are presently directed, and the operations to control at least one of the processing of the video frames and the displaying of the information on the display device, further comprise: performing at least one of: decreasing brightness of the region of the display device; decreasing contrast of the region of the display device; determining a primary color of the real-world feature and selecting a color of the information that is displayed in the region of the display device to differentiate from the primary color of the real-world feature; increasing brightness of another region of the display device that does not overlap a location of the real-world feature in the video frames; increasing contrast of the other region of the display device; determining a primary color of the real-world feature and selecting a color of the information that is displayed in the other region of the display device to differentiate from the primary color of the real-world feature.

15. A method by a portable electronic device for a mixed reality, MR, headset including a lens through which a user wearing the MR headset can view real-world features and including a holder configured to retain the portable electronic device in a defined orientation relative to the lens, wherein a display device of the portable electronic device is arranged to display information that is projected on the lens for reflection directly or indirectly toward the user's eyes and a camera of the portable electronic device, the method comprising: processing the video frames from the camera of the portable electronic device to identify locations of at least one real-world feature; displaying information at locations on the display device of the

portable electronic device; and controlling at least one of the processing of the video frames to identify locations of at least one real-world feature and the displaying of the information on the display device, to at least partially reduce occurrence in the video frames of the information that is displayed by the display device, wherein the controlling of the processing of the video frames comprises controlling the processing of the video frames to identify locations of at least one real-world feature to occur during second time durations while the information is not displayed on the display device and further controlling the processing of the video frames to identify locations of at least one real-world feature to not occur during first time durations while the information is displayed on the display device, and wherein the controlling of the displaying of the information on the display device comprises controlling the displaying of the information on the display device during the first time durations to occur while the processing is not performed on the video frames to identify locations of at least one real-world feature and further controlling the ceasing of the displaying of the information on the display device during the second time durations to occur while the processing is being performed on the video frames to identify locations of at least one real-world feature.

16. The method of claim 15, further comprising: determining an amount of overlap occurring between: 1) the information that is displayed by the display device and occurring in the video frames from the camera; and 2) the locations of the real-world feature that are identified by processing of the video frames from the camera; and initiating the controlling of at least one of the processing of the video frames to identify locations of at least one real-world feature to occur during the second time durations and the displaying of the information on the display device during the first time durations, based on the amount of overlap satisfying a defined rule.

17. The method of claim 15, further comprising; displaying a calibration pattern on the display device; processing the video frames to determine a region of the video frames containing the graphical pattern; ceasing display of the calibration pattern on the display device; following cessation of display of the calibration pattern, processing the video frames to determine when a location of the real-world feature enters the region of the video frames; and responsive to the location of the real-world feature entering the region of the video frames, initiating the controlling of at least one of the processing of the video frames to identify locations of at least one real-world feature to occur during the second time durations and the displaying of the information on the display device.

18. The method of claim 15, wherein controlling at least one of the processing of the video frames and the displaying of the information on the display device, further comprises: determining when a display quality prioritization rule is satisfied; and responsive to the display quality prioritization rule becoming satisfied, controlling the displaying of the information on the display device to increase a frequency at which the display device is repetitively refreshed to display the information during the first time durations to occur while the processing is not performed on the video frames to identify locations of at least one real-world feature, and/or controlling the processing of the video frames to identify locations of at least one real-world feature to decrease a frequency at which the video frames from the camera are processed to identify locations of the real-world feature during the second time durations while the information is not displayed on the display device.

19. The method of claim 15, wherein controlling at least one of the processing of the video frames and the displaying of the information on the display device, further comprises: determining when a camera video prioritization rule is satisfied; and responsive to the camera video prioritization rule becoming satisfied, controlling the displaying of the information on the display device to decrease a frequency at which the display device is repetitively refreshed to display the information during the first time durations to occur while the processing is not performed on the video frames to identify locations of at least one real-world feature, and/or controlling the processing of the video frames to identify locations of at least one real-world feature to increase a frequency at which the video frames from the camera are processed to identify locations of the real-world feature during the second time durations while the information is not displayed on the display device.

20. The method of claim 15, wherein controlling at least one of the processing of the video frames and the displaying of the information on the display device, further comprises: repetitively alternating between displaying the information on the display device and ceasing display of the information on the display device, wherein the processing of the video frames is controlled to occur during first time durations while the information is not displayed on the display device and controlled to not occur during second time durations while the information is displayed on the display device.

21. The method of claim 15, further comprising: determining when a display quality

prioritization rule is satisfied; and responsive to the display quality prioritization rule becoming satisfied, increasing a duty cycle of the second time duration during which the display device is repetitively refreshed to display the information relative to the first time duration during which the display device is repetitively refreshed not displaying the information.

22. The method of claim 15, further comprising: determining when a camera video prioritization rule is satisfied; and responsive to the camera video prioritization rule becoming satisfied, decreasing a duty cycle of the second time duration during which the display device is repetitively refreshed to display the information relative to the first time duration during which the display device is repetitively refreshed not displaying the information.

23. The method of claim 15, further comprising processing the video frames from the camera to identify a region of the display device that displays a portion of information which occurs in the video frames at least partially overlapping a location of the real-world feature, and wherein controlling at least one of the processing of the video frames and the displaying of the information on the display device, further comprises: repetitively alternating between displaying the portion of the information within the region of the display device and ceasing display of the portion of the information within the region of the display device, wherein the processing of the video frames is controlled to occur during the first time durations while the portion of the information is not displayed within the region of the display device and controlled to not occur during the second time durations while the portion of the information is displayed within the region of the display device.

24. The method of claim 23, wherein repetitively alternating between displaying the portion of the information within the region of the display device and ceasing display of the portion of the information within the region of the display device, further comprises: determining when a display quality prioritization rule is satisfied; and responsive to the display quality prioritization rule becoming satisfied, decreasing a duty cycle of the second time duration during which the region of the display device is repetitively refreshed to display the portion of the information relative to the second time duration during which the region of the display device is repetitively refreshed not displaying the portion of the information.

25. The method of claim 23, wherein repetitively alternating between displaying the portion

of the information within the region of the display device and ceasing display of the portion of the information within the region of the display device, further comprises: determining when a camera video prioritization rule is satisfied; and responsive to the camera video prioritization rule becoming satisfied, decreasing a duty cycle of the second time duration during which the region of the display device is repetitively refreshed to display the portion of the information relative to the second time duration during which the region of the display device is repetitively refreshed not displaying the portion of the information.

26. The method of claim 15, further comprising processing the video frames from the camera to identify a region of the video frames that contains the information, and wherein controlling at least one of the processing of the video frames and the displaying of the information on the display device, further comprises: processing the region of the video frames identified as containing the information at a lower frequency to identify locations of at least one real-world feature than another region of the video frames being processed to identify locations of at least one real-world feature that does not contain the information.

27. The method of claim 15, further comprising processing the video frames from the camera to identify a region of the display device that displays a portion of information which at least partially overlaps a location of the real-world feature in the video frames, and wherein controlling at least one of the processing of the video frames and the displaying of the information on the display device, further comprises: performing at least one of: decreasing brightness of the region of the display device; decreasing contrast of the region of the display device; and determining a primary color of the real-world feature and selecting a color of the information that is displayed in the region of the display device to differentiate from the primary color of the real-world feature.

28. The method of claim 15, further comprising processing the video frames from the camera to identify a region of the display device that displays a portion of information which at least partially overlaps a location of the real-world feature in the video frames, and wherein controlling at least one of the processing of the video frames and the displaying of the information on the display device, further comprises: performing at least one of: increasing brightness of another region of the display device that does not overlap a location of the real-world feature in the video frames; increasing contrast of the other region of the display device; determining a primary color of the real-world feature and selecting a color of the

information that is displayed in the other region of the display device to differentiate from the primary color of the real-world feature.

29. The method of claim 15: further comprising identifying a region of the display device at which the user's eyes are presently directed, and wherein controlling at least one of the processing of the video frames and the displaying of the information on the display device, further comprises: performing at least one of: decreasing brightness of the region of the display device; decreasing contrast of the region of the display device; determining a primary color of the real-world feature and selecting a color of the information that is displayed in the region of the display device to differentiate from the primary color of the real-world feature; increasing brightness of another region of the display device that does not overlap a location of the real-world feature in the video frames; increasing contrast of the other region of the display device; determining a primary color of the real-world feature and selecting a color of the information that is displayed in the other region of the display device to differentiate from the primary color of the real-world feature.

30. A computer program product for a portable electronic device for a mixed reality, MR, headset having a lens through which a user wearing the MR headset can view real-world features, wherein a display device of the portable electronic device is arranged to display information that is projected on the lens for reflection directly or indirectly toward the user's eyes and a camera of the portable electronic device, the computer program product comprising: a non-transitory computer readable medium storing program code executable by a processor of the portable electronic device to perform operations comprising: processing the video frames from the camera of the portable electronic device to identify locations of at least one real-world feature; displaying information at locations on the display device of the portable electronic device; and controlling at least one of the processing of the video frames to identify locations of at least one real-world feature and the displaying of the information on the display device, to at least partially reduce occurrence in the video frames of the information that is displayed by the display device, wherein the controlling of the processing of the video frames comprises controlling the processing of the video frames to identify locations of at least one real-world feature to occur during second time durations while the information is not displayed on the display device and further controlling the processing of the video frames to identify locations of at least one real-world feature to not occur during first time durations while the information is displayed on the display device, and wherein the

controlling of the displaying of the information on the display device comprises controlling the displaying of the information on the display device during the first time durations to occur while the processing is not performed on the video frames to identify locations of at least one real-world feature and further controlling the ceasing of the displaying of the information on the display device during the second time durations to occur while the processing is being performed on the video frames to identify locations of at least one real-world feature.