

CLAIMS

1. A system for storage and bandwidth reduction of visual events in association with an activity comprising:

at least one visual event detector having at least one camera that acquires images of the activity, at least one processor receiving the images and a visual event detection process operating at least in part on the processor that processes the images;

a queuing process that identifies the visual events from the at least one visual event detector and stores the visual events; and

a communications process that enables a reduced-bandwidth communications channel adapted to transmit the stored visual events in a reduced-bandwidth and queued format to a remote location.

2. ~~The system as set forth in claim 1~~ wherein the visual events comprise activities related to at least one of bridge operations, ~~cargo operations, maintenance operations,~~ and safety operations, ~~and vetting and security~~ with respect to a vessel.

3. ~~The system as set forth in claim 2,~~ and wherein the visual events are based upon at least one of software-based event detectors and hardware-based event detectors that identify predetermined characteristics within one or more of the images and determine a state based upon the characteristics.

42. The system as set forth in claim ~~31~~ wherein the visual events provide data primitives that are derived into user information, the data primitives including at least one of statistics, pattern matches, metrics and time.

53. The system as set forth in claim ~~42~~ wherein the stored visual events are communicated across the reduced-bandwidth communications channel based upon user-set priorities, wherein higher priority events are communicated first in a queue from the stored visual events.

64. The system as set forth in claim ~~53~~ further comprising a user interface that displays information of the at least one of the bridge operations, ~~cargo operations,~~

~~maintenance operations, and safety operations, and vetting and security~~ at a base location in one or more predetermined presentation formats.

5. The system as set forth in claim 4 wherein the visual events further comprise activities related to at least one of cargo operations, maintenance operations, and vetting and security and user interface that displays information of the at least one of the cargo operations, maintenance operations, and vetting and security at the base location in one or more predetermined presentation formats.

6. The system as set forth in claim 4 wherein the safety operations comprise at least one of a person interacting with equipment, a person stopping at a location, a person walking or staring at a location, a person wearing a hard-hat, life vest or other protective equipment and a person holding a safety tool.

7. The system as set forth in claim 4 further comprising a server on the vessel that interacts with the communication process and receives at least one of location and directional information navigation systems of the vessel.

~~78.~~ The system as set forth in claim ~~64~~ wherein the user interface includes inputs that enable the user-set priorities.

~~89.~~ The system as set forth in claim ~~64~~ wherein ~~the user interface includes inputs that enable adding or setting configuration parameters for the~~ visual event detectors detects a small boat at a specific location, start time, and end time.

~~910.~~ The system as set forth in claim ~~64~~ wherein the user information includes at least one of fleet reports on a plurality of vessels associated with the user interface, ~~vessel reports on the vessel~~, occurrence of discrete events and occurrence of complex events comprising a plurality of discrete events.

~~10~~11. The system as set forth in claim ~~9~~10 wherein the user information is displayed in a dashboard format comprising one or more visual windows, alerts and numerical data.

12. The system as set forth in claim 11 base location comprises a land-based server that receives the stored visual events through the communications process and processes the stored visual events to display information relative to the visual events on a remote user interface in a predetermined format.

13. The system as set forth in claim 12 wherein the user information relative is displayed in a graphical format with respect to the vessel and a fleet of vessels.

14. The system as set forth in claim 13 wherein the user information includes statistics related to the vessel and the fleet of vessels.

15. The system as set forth in claim 14 wherein the statistics are displayed in a graph with respect to time.

16. The system as set forth in claim 14 wherein the user interface includes selector to access statistics related to each of the vessel and the fleet of vessels.

17. The system as set forth in claim 4 wherein the one or more presentation formats include a graph with respect to time.

~~12~~18. A user interface operated by a base location processor located at a base location and receiving visual events over a communication channel from a remote, moving or stationary object, in which the object includes at least one visual event detector having at least one camera that acquires images of ~~the an~~ activity, at least one object processor receiving the images and a visual event detection process operating at least in part on

the object processor that processes the images and a communications process that enables ~~a~~the communications channel adapted to transmit ~~the~~ stored visual events in queued format to ~~a~~the base location, ~~and~~ the user interface at the base location comprising:

~~wherein the user interface includes a dashboard display for displaying information associated with the object with the object and enables configurations of,~~

wherein the visual events comprise activities related to at least one of (a) priority of visual events to be communicated over the communications channel
bridge operations, safety operations, with respect to a vessel or fleet of vessels, and wherein the visual events are based upon at least one of software-based event detectors and (b) configuration of hardware-based event detectors that identify predetermined characteristics associated with within one or more of the visual events
images and determine a state based upon the characteristics.

~~13~~19. The user interface as set forth in claim ~~12~~18 wherein the communications channel is a reduced-bandwidth, wireless communications channel.

~~14~~20. The user interface as set forth in claim ~~13~~19 wherein the object is a sea-going vessel and the visual events relate to at least one of safety, ~~maintenance, cargo handling, and~~ bridge operations, ~~and vetting and security~~ relative to the sea-going vessel.

~~15~~21. The user interface as set forth in claim ~~14~~20, ~~further comprising,~~ 20, wherein the dashboard display on the user interface ~~that~~ provides at least one of configuration, status and performance information relative to the sea-going vessel.

~~16~~22. The user interface as set forth in claim ~~15~~20 wherein the dashboard display on the user interface ~~that~~ provides at least one of configuration, status and performance information relative each vessel of a fleet of vessels.

23. The user interface as set forth in claim 20 wherein the dashboard display on the user interface provides at least one of configuration, status and performance information relative to the aggregated fleet of vessels.

~~17~~24. The user interface as set forth in claim ~~14~~19 wherein the information includes one or more forms of displayed sensor data having at least one of a label, highlight, comment and annotation visually appended thereto.

~~18.~~—~~The user interface as set forth in claim 14 wherein the information includes a workflow provided between one or more users or vessels.~~

25. The user interface as set forth in claim 19 wherein the visual events include detection of a small boat at a specific location, start time, and end time.

~~19.~~—~~The user interface as set forth in claim 14 wherein the communication channel is arranged to transmit control data from the user interface to one or more of the vessels and receive feedback via the user interface relative to actions on the vessel with respect to the control data.~~

~~20~~26. A method for storage and bandwidth reduction of visual events in association with an activity comprising the steps of:

acquiring images of the activity with at least one camera and performing visual event detection with a processor;

identifying the visual events from ~~the at least one visual software-based and hardware-based event detectors~~ that identify predetermined characteristics within one or more of the images and determine a state based upon the characteristics and storing the visual events in a queue based upon predetermined parameters, wherein the visual events comprise activities related to at least one of bridge operations and safety operations with respect to a sea-going vessel; and

communicating with a remote location over a reduced-bandwidth communications channel adapted to transmit the stored visual events in a reduced-bandwidth and queued format to the remote location.