CLAIMS

1. A method of automatically moving, by an automatic location placement system, a marine vessel, the method comprising:

receiving, by a central processing unit, from a vision ranging photography system, at least one optical feed including data providing a mapping of an environment surrounding a marine vessel;

displaying, by the central processing unit, on a touch screen monitor, the mapping of the environment;

receiving, by the central processing unit, from the touch screen monitor, target location data; and

directing, by the central processing unit, at least one element of a propulsion system of the marine vessel, to move the marine vessel to the targeted location, using the mapping.

2. The method of claim 1 further comprising displaying an overlay of a geometry of an environment surrounding the marine vessel, over the mapping of the environment received via the at least one optical feed, wherein the optical feed provides live video of the environment surrounding the marine vessel.
3. The method of claim 1, wherein receiving the at least one optical feed further comprises receiving at least one update of the data.
4. The method of claim 1 further comprising receiving, by the central processing unit, from an infrared vision system, transmitted data including a second mapping of the environment surrounding a marine vessel.
5. The method of claim 4 further comprising displaying, on the touch screen monitor, an output received from the infrared vision system.
6. The method of claim 4 further comprising displaying, on the touch screen monitor, the second mapping.
7. The method of claim 4 further comprising displaying, on the touch screen monitor, the second mapping as an overlay over the mapping received from the vision ranging photography system via the at least one optical feed.
8. The method of claim 1, wherein receiving further comprises receiving an identification of a targeted location for the marine vessel, the targeted location being between two aft external objects.

9. The method of claim 1 further comprising validating a selected location area identified in the target location data.
10. The method of claim 9, wherein validating further comprises confirming that the selected location area will accommodate the marine vessel.
11. The method of claim 1, wherein directing further comprises:

engaging, by the central processing unit, at least one aft ranger laser scanner;

receiving, by the central processing unit, from the at least one aft ranger laser scanner, data including at least one of distance, velocity, and dimensional area information.
12. The method of claim 1, wherein directing further comprises automatically providing, by the central processing unit, the at least one element of the propulsion system of the marine vessel, a path of travel to the selected targeted location, upon receiving the targeted location data from the touch screen monitor.
13. The method of claim 1, wherein directing further comprises automatically controlling, by the central processing unit, at least one steering system of the marine vessel to move the marine vessel into the targeted location, upon receiving the targeted location data from the touch screen monitor.
14. The method of claim 1, wherein directing further comprises automatically controlling, by the central processing unit, at least one drive system of the marine vessel to move the marine vessel into the targeted location, upon receiving the targeted location data from the touch screen monitor.
15. The method of claim 1, wherein directing further comprises engaging, by the central processing unit, a thruster of the marine vessel.
16. The method of claim 1, wherein directing further comprises engaging, by the central processing unit, a drive system of the marine vessel.
17. The method of claim 1, wherein directing further comprises determining to engage a plurality of elements of the propulsion system of the marine vessel substantially simultaneously.
18. The method of claim 1, wherein directing further comprises determining, by the central processing unit, an instruction to provide to the at least one element in response to the received mapping.

19. The method of claim 1 further comprising determining a position of the marine vessel in relation to the target location.
20. The method of claim 19 further comprising determining the position based on data included in the at least one optical feed.
21. The method of claim 19 further comprising determining the position based on the target location data.
22. The method of claim 19, wherein directing further comprises determining, by the central processing unit, an instruction to provide to the at least one element in response to the position of the marine vessel in relation to the target location.
23. The method of claim 1 further comprising comparing an expected behavior of the marine vessel with a response of the marine vessel to the direction.
24. The method of claim 1 further comprising:

detecting, by the central processing unit, that a human operator has manually interfered with operation of the marine vessel; and

disengagement, by the central processing unit, of the automatic location placement system based upon the detection of manual interference.

25. The method of claim 1 further comprising directing, by the central processing unit, at least one element of a propulsion system of the marine vessel, to maintain a location of the marine vessel at the targeted location.
26. An automatic location placement system for placement of a marine vessel, the system comprising:

a vision ranging photograph system generating at least one optical feed;

at least one infrared vision system;

at least one ranger laser scanner;

at least one inertial measurement unit;

at least one global positioning system unit;

an touch screen control monitor;

a propulsion system of a marine vessel including at least one thruster, at least one drive system, and at least one actuator; and

a central processing unit located on the marine vessel and operatively connected to the propulsion system, the central processing unit:

receiving, from the vision ranging photography system, the at least one optical feed, the feed including data providing a mapping of an environment surrounding the marine vessel;

displaying, by the central processing unit, on an touch screen monitor, the mapping of the environment;

receiving, from the touch screen monitor, target location data; and

directing, by the central processing unit, at least one element of the propulsion system of the marine vessel, to move the marine vessel to the targeted location, using the mapping.

Claims

1. A method for automatically maneuvering a marine vessel to a targeted location, the method comprising:

generating, using data received from a GPS unit, a mapping of an environment of the marine vessel;

identifying, based on the mapping, the targeted location;

receiving, by a processor control unit, information representing the targeted location;

engaging, at the processor control unit, a propulsion system of the marine vessel to automatically maneuver the marine vessel to the targeted location, comprising:

identifying a position of the marine vessel, comprising sensing, using at least one transducer, a position of the marine vessel relative to at least one obstacle;

calculating, at the processor control unit, a collision-free path of travel of the marine vessel, incorporating the position of the marine vessel relative to the at least one obstacle; and

engaging the propulsion system of the marine vessel to drive the marine vessel toward the targeted location in the collision-free path of travel.

2. The method of claim 1, further comprising:

automatically stopping the marine vessel at a location adjacent to an external object.

3. The method of claim 2, wherein engaging the propulsion system of the marine vessel to drive the marine vessel toward the targeted location in the collision-free path of travel comprises:

detecting the at least one obstacle;

in response to detecting the at least one obstacle, reducing a velocity of the marine vessel.

4. The method of claim 2, further comprising:

maintaining the marine vessel at the location adjacent to the external object.

5. The method of claim 4, wherein the location adjacent to the external object comprises a location at a pre-selected distance from the external object, and wherein maintaining the marine vessel at the location adjacent to the external object comprises maintaining the marine vessel at the pre-selected distance from the external object.

6. The method of claim 1, wherein identifying the position of the marine vessel further comprises:

obtaining additional data from the GPS unit; and

identifying the position of the marine vessel based on:

a position, sensed using the at least one transducer, of the marine vessel relative to the at least one obstacle; and

the additional data obtained from the GPS unit.

7. The method of claim 1, wherein engaging the propulsion system of the marine vessel to automatically maneuver the marine vessel toward the targeted location further comprises, at the processor control unit, automatically compensating for lateral movement of the marine vessel by controlling a plurality of actuators, in the propulsion system of the marine vessel, which engage a main drive to maintain the marine vessel in the collision-free path of travel toward the targeted location.

8. The method of claim 1, wherein sensing the position of the marine vessel relative to the at least one obstacle comprises using a plurality of transducers to detect and transmit a set of distance information between the marine vessel and the at least one obstacle.

9. The method of claim 8, wherein the set of distance information provides feedback to the processor control unit to enable a plurality of thrusters, in conjunction with a main drive system on the marine vessel, to drive the marine vessel in a sideways, fore, and aft direction toward the targeted location in a controlled path of travel.

10. The method of claim 1, wherein sensing the position of the marine vessel relative to the at least one obstacle comprises:

sensing, using the at least one transducer, the at least one obstacle, to generate obstacle-related data; and

transmitting information representing the obstacle-related data to the processor control unit; and

memorizing, using the processor control unit, the obstacle-related data.

11. The method of claim 10, further comprising:

utilizing the obstacle-related data during movement of the marine vessel.

12. The method of claim 1, wherein the targeted location comprises a targeted location adjacent to an external object, and wherein engaging the propulsion system of the marine vessel comprises engaging the propulsion system of the marine vessel to drive the marine vessel toward the targeted location adjacent to the external object.

13. The method of claim 12, wherein engaging the propulsion system of the marine vessel comprises engaging the propulsion system of the marine vessel to drive the marine vessel toward the targeted location adjacent to the external object.

14. The method of claim 2, wherein automatically maneuvering the marine vessel to the targeted location comprises:

at the processor control unit, receiving, from the at least one transducer, updates to a position of the marine vessel relative to the external object; and

automatically maneuvering the marine vessel to the targeted location based on the updates to the position of the marine vessel relative to the external object.

15. The method of claim 1, wherein engaging the propulsion system comprises determining, by the processor control unit, a required directional force to allocate to the propulsion system of the marine vessel, based upon a current location of the marine vessel relative to the targeted location.

16. The method of claim 1, wherein generating the mapping comprises generating the mapping using the data received from the GPS unit and data received from at least one unit other than the GPS unit, and applying a sensor fusion algorithm to the data received from the GPS unit and the data received from the at least one unit other than the GPS unit to generate the mapping.

17. The method of claim 16, wherein the at least one unit other than the GPS unit comprises a vision ranging system, and wherein the data received from the at least one unit other than the GPS unit comprises data received over an optical feed from the vision ranging system.

18. The method of claim 16, wherein the at least one unit other than the GPS unit comprises a infrared vision system, and wherein the data received from the at least one unit other than the GPS unit comprises data received over an optical feed from the infrared vision system.

19. The method of claim 16, wherein the at least one unit other than the GPS unit comprises a high precision inertial measurement unit (IMU), and wherein the data received from the at least one unit other than the GPS unit comprises data received over an optical feed from the high precision inertial measurement unit (IMU).

20. The method of claim 1, wherein automatically maneuvering the marine vessel to the targeted location comprises:

receiving updates to a location of the marine vessel;

responding to the updates to the location of the marine vessel by controlling the propulsion system of the marine vessel to maintain the collision-free path of travel of the marine vessel to the targeted location.

21. The method of claim 20, wherein receiving the updates to the location of the marine vessel comprises receiving the updates to the location of the marine vessel from the GPS unit.

22. The method of claim 20, wherein receiving the updates to the location of the marine vessel comprises receiving the updates to the location of the marine vessel from a photographic vision system.

23. The method of claim 20, wherein receiving the updates to the location of the marine vessel comprises receiving the updates to the location of the marine vessel from a high precision inertial measurement unit (IMU).

24. A system for automatically maneuvering a marine vessel to a targeted location, the system comprising a processor control unit adapted to perform a method, the method comprising:

generating, using data received from a GPS unit, a mapping of an environment of the marine vessel;

identifying, based on the mapping, the targeted location;

receiving information representing the targeted location;

engaging a propulsion system of the marine vessel to automatically maneuver the marine vessel to the targeted location, comprising:

identifying a position of the marine vessel, comprising controlling at least one transducer to sense a position of the marine vessel relative to at least one obstacle;

calculating a collision-free path of travel of the marine vessel, incorporating the position of the marine vessel relative to the at least one obstacle; and

engaging the propulsion system of the marine vessel to drive the marine vessel toward the targeted location in the collision-free path of travel.

25. The system of claim 24, wherein the method further comprising:

automatically stopping the marine vessel at a location adjacent to an external object.

26. The system of claim 25, wherein the method further comprises:

maintaining the marine vessel at the location adjacent to the external object.

27. The system of claim 24, wherein identifying the position of the marine vessel further comprises:

obtaining additional data from the GPS unit; and

identifying the position of the marine vessel based on:

a position, sensed using the at least one transducer, of the marine vessel relative to the at least one obstacle; and

the additional data obtained from the GPS unit.

28. The system of claim 24, wherein sensing the position of the marine vessel relative to the at least one obstacle comprises:

sensing, using the at least one transducer, the at least one obstacle, to generate obstacle-related data; and

transmitting information representing the obstacle-related data to the processor control unit;

memorizing, using the processor control unit, the obstacle-related data;

utilizing the obstacle-related data during movement of the marine vessel.

29. The system of claim 28, wherein the targeted location comprises a targeted location adjacent to an external object, and wherein engaging the propulsion system of the marine vessel comprises engaging the propulsion system of the marine vessel to drive the marine vessel toward the targeted location adjacent to the external object.

30. The system of claim 24, wherein generating the mapping comprises generating the mapping using the data received from the GPS unit and data received from at least one unit other than the GPS unit, and applying a sensor fusion algorithm to the data received from the GPS unit and the data received from the at least one unit other than the GPS unit to generate the mapping.