ORBIS
AN ENGINEERING SOLUTIONS COMPANY

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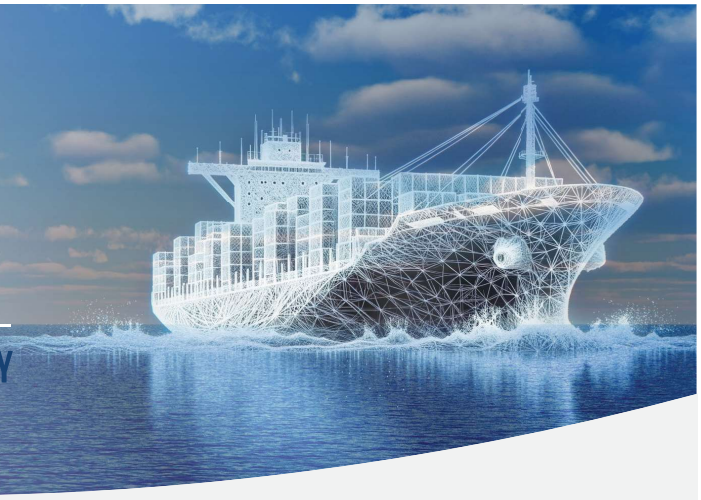
TRIM MANAGEMENT SYSTEM



ENHANCE FUEL EFFICIENCY, TRANSIT SPEED, AND SAFETY

THE PROBLEM

Conventional sight gauges, or other methods used at dock for ship balance are inadequate at sea, resulting in suboptimal trim and list, increased drag, and inefficient power utilization.

AT DOCK

Current trim measuring processes are only accurate while at dock.

AT SEA

Measuring trim at sea is challenging due to constant water motion, ship's movement, lack of fixed reference points, and changing environmental conditions.

SAFETY

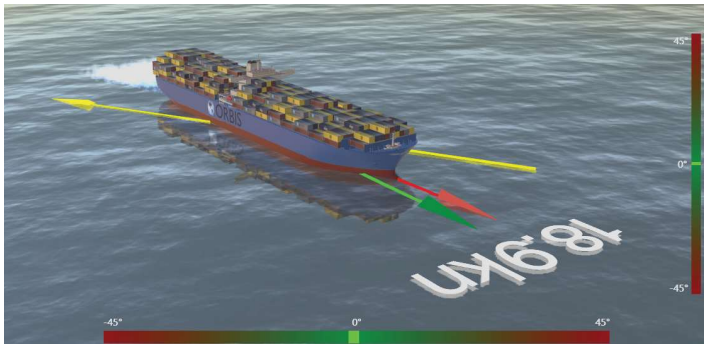
Sea state conditions could contribute to dangerous parametric roll conditions and extreme vessel stresses.

These challenges contribute to prolonged transit times and escalated fuel consumption, incurring significant financial implications. Our solution offers real-time data-driven adjustment capabilities, counteracting variations due to fuel consumption, weather, sea conditions, and other dynamics thereby ensuring continual balance, enhanced fuel economy, and safety.

OUR SOLUTION

TRIM UNDERWAY

Our sophisticated system employs sensor fusion within an advanced sensor array, integrating real-time kinematic positions with inertial measurements. As a result, we can precisely ascertain a vessel's trim and list angles, providing a comprehensive understanding of its spatial orientation and dynamic movement while underway.



AI OPTIMIZED

Our AI-driven platform presents a sophisticated integration of sensor technology and large-scale data analysis. By analyzing sensor inputs against an expansive database of historical routes, weather patterns, and performance indices, it offers a comprehensive and dynamic 3D model of onboard conditions and suggested optimizations for improved efficiencies.

FOR MORE INFORMATION CONTACT:

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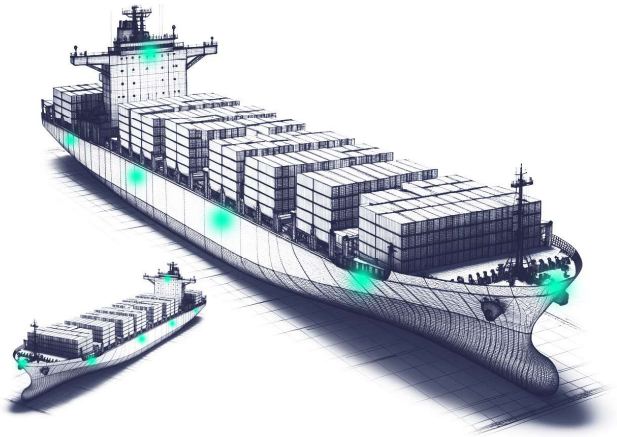
HOW IT WORKS

The Trim Management system calculates the vessel's orientation and translational movements relative to the waterline using multiple sensor fusion methods to ensure accuracy and redundancy. Sensor fusion aggregates real-time data from sensor modules throughout the vessel along with available vessel data, weather forecasts, and historic calculations.



To set up the Trim Management system, an array of enclosed sensor modules is strategically placed throughout the perimeter of the vessel. Each sensor module contains 9-axis inertial measurement units, multi-band GNSS receiver with RTK, and radio transceiver to broadcast the module's information to a central base station for processing. The central base station is a performance computer with dedicated hardware and software that effectively executes our application quickly and precisely to model the vessel and sea state. The vessel model details and calculations can be monitored and recorded in the user interface.

Based on compiled feedback from a multitude of sensors in the Trim Management system and from the vessel, a trained Artificial Intelligence (AI) model is used for course recommendations that optimize trim to help improve fuel usage. Additionally, our platform actively monitors sea state conditions that might result in hazardous parametric roll or induce intense hogging and sagging. This aids operators in their decision-making processes, ensuring safe and efficient maritime operations. All in a compact, operator-friendly format.

THE RESULT

A sophisticated and intuitive user interface that displays a detailed 3D model of the ship, offering enhanced precision to guide users in achieving optimal fuel efficiency, safety, and operational effectiveness.

ABOUT

ORBIS is a veteran-owned small business (VOSB) established in 2000 that provides engineering, technical, and consulting services to the Department of Defense (DoD) and Commercial Clients. Our employee demographics include engineers, scientists, researchers, and technicians, often prior military personnel representing all branches of the Armed Forces.

CAPABILITIES

- Electrical, Mechanical and Software Engineering
- Circuit Card Assembly (CCA) Design
- Embedded System Design, FPGA Programming
- Reverse Engineering Services
- AI Solutions
- Automated Test, Data Acquisition and Control
- LabVIEW Software Expertise, Certified Developers
- CAD and SolidWorks Modeling, Simulation
- Prototyping through Production Capabilities
- ISO 9001:2015 Certified
- Appraised at CMMI L3 for Development

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