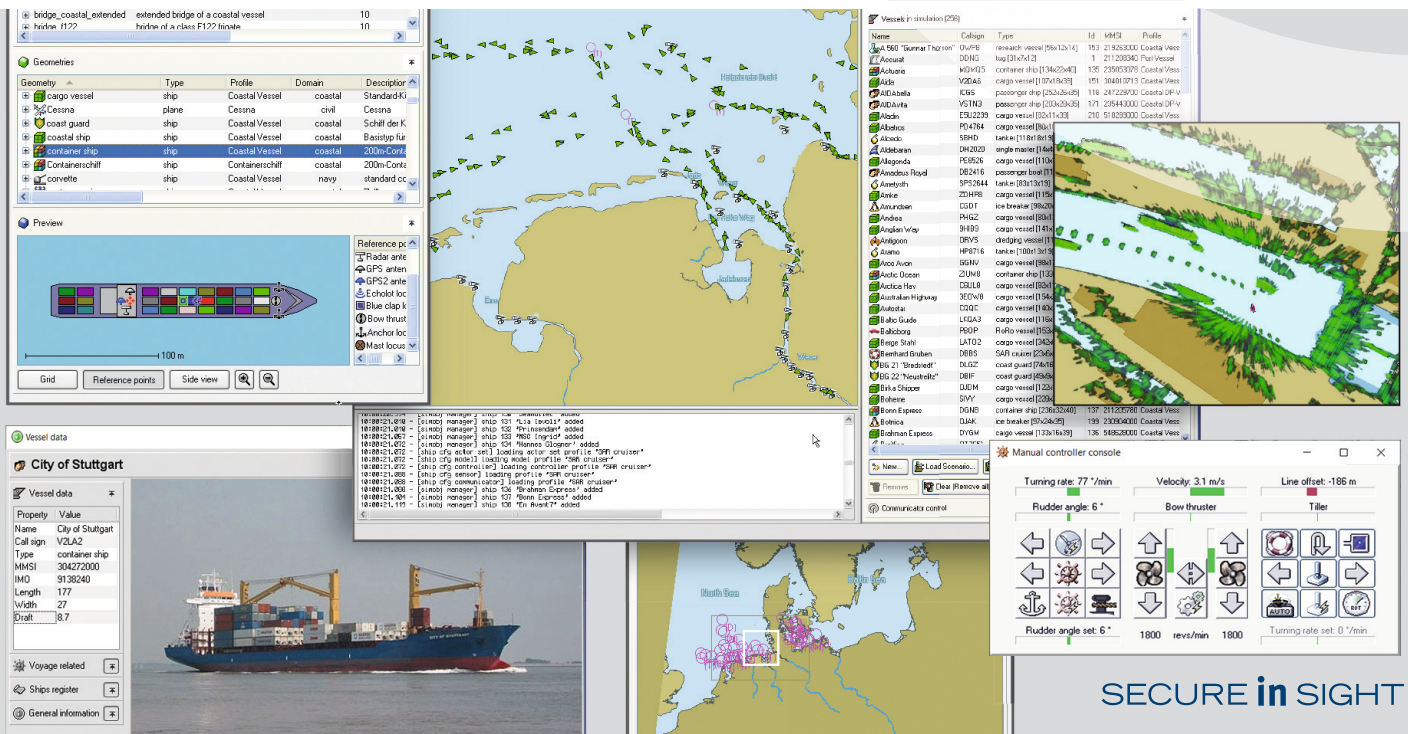# inVNE

Vessel Traffic Simulator and Sensor Data Generator

SECURE **in** SIGHT

Versatile training and test tool for surveillance and navigation systems

inVNE is a VIRTUAL NAVIGATION ENVIRONMENT designed to simulate vessel traffic and the maritime environment. The simulator generates real time sensor measurements and communication data based on the programmed traffic scenario, taking into account a wide variety of environmental conditions including rain, wind, water current and tide.

The simulation focuses on closely modeling the dynamics of typical ship movements, on providing the functionality of common nautical equipment (including failure modes), and on reproducing various interactions between ships and shore based surveillance stations.

For each ship, the operator can choose from various components and methods to define the movement, the interaction with the environment, the reaction to control signals, and the properties and reliability of equipped sensors and communication devices.

Special emphasis lies on a realistic emulation of navigation sensors – like RADAR (video), tracker, and GPS – as well as communication devices (AIS, SART, ADS-B, …). By providing the entire range of sensor signals using standard protocols (ASTERIX, NMEA 0183), the simulator can be fully integrated into existing or planned vessel traffic surveillance systems.

The navigation environment is presented using a modern electronic nautical chart (ENC), visualizing position, movement and status of every traffic element and allowing various forms of interaction.

In combination with CSS/VTS, navigation components or in system set-ups from in-innovative navigation GmbH, inVNE forms a stand-alone simulator for training pilots and nautical staff. inVNE then takes on the role of an instructor workstation. The comprehensive user interface of inVNE allows the instructor to simulate a large variety of complex and diverse vessel traffic scenarios.

in - COMPONENTS

A product of **innovative navigation**

Graphical User Interface and Key Features

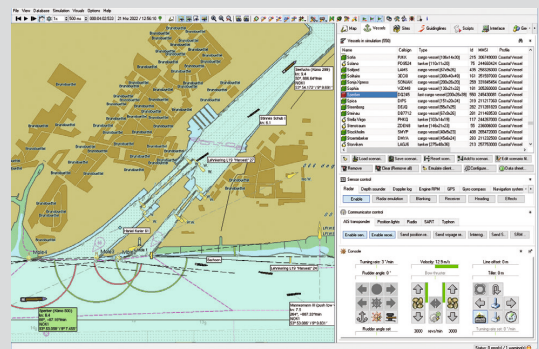▲ inVNE driving the VTS Training Center of the German coastal surveillance system

Navigational radar training with 3D visualization at a bridge driven by inVNE ▲

GUI of inVNE, showing a scene at the entrance to the Kiel Canal ▶

Highlights

- Realistic simulation of marine and air traffic and the maritime environment
- Up to 1000 vessels calculated simultaneously
- Diverse assortment of vessel models, sensor types and surveillance equipment
- Vessel movement and behavior can be controlled by routes, scripts, and interactively by the instructor on a modern GUI
- Generation of highly realistic radar video, ASTERIX, AIS and NMEA 0183 output data
- Seamless integration of recorded or live data

- Can be combined with state-of-the-art 3D visualization to show the outside view of the ship's bridge
- Full scalability for various simulator architectures: from single stand-alone simulators to complex multi-instructor multi-operator set-ups
- Well suited as standalone simulator and in union with VTS/CSS systems allowing integrated training at the normal working stations
- Allows validation of data processing components, radar displays and navigation systems

Further information about recent developments on:
www.innovative-navigation.de

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