Rescue ship of the German Maritime Search and Rescue Association DGzRS in operation
© DGzRS

HELP FOR THE SEA RESCUERS
CML IMPROVES MARITIME RADIO COMMUNICATION

Machine noise, harsh environmental conditions or different dialects are just a few of the sources of interference that have a negative impact on the quality of radio communication at sea. Even the use of standard phrases, the so-called IMO Standard Marine Communication Phrases (IMO SMCP), leads to comprehension problems between transmitter and receiver, as the processing of numerous marine accidents shows.

To reduce these difficulties, a project consortium consisting of DGzRS, Fraunhofer IAIS, Rhothetha Elektronik GmbH and Fraunhofer CML has launched the ARTUS research project.

The aim of ARTUS is the recording and automatic transcription of ma-

ritime VHF communication using artificial intelligence (AI). With the help of the generated transcription, linguistic ambiguities can be quickly recognized and clarified. Furthermore, the chronological documentation of the radio communication facilitates the immediate traceability of the respective conversation situation, which in particular will simplify the work of the maritime units involved in rescue missions.

In addition to the written information, ARTUS also localizes the transmitters of radio messages at the same time. Based on the direction finding of the VHF transmitter and using a complex positioning algorithm, the position of a ship involved in an accident is localized, so that in future rescue forces can

be quickly at the scene of the accident even in situations where a ship does not transmit an AIS position.

In the ARTUS project, the Fraunhofer CML will, among other tasks, generate the basis for training the speech recognition in the form of a deep neural network and implement and test the technology to be developed in ship handling simulators.

The project is funded by the Federal Ministry of Education and Research (BMBF) as part of the „Anwender-Innovativ: Forschung für die zivile Sicherheit" („User Innovation: Research for Civil Security") programme of the Federal Government. The project runs from 1 March 2019 to 28 February 2022.

MARITIME INNOVATION INSIGHTS MII
# RESEARCH FOR THE MARITIME INDUSTRY

The second MII of the CML took place at the beginning of May at the TUHH and the organizers were happy about a fully booked event. In the three main topics „Digital & Autonomous Ports", „Maritime Data Analytics & Artificial Intelligence" and „Smart & Green Shipping" current research projects were presented by external speakers of the research partners and scientists of the CML and discussed with the participants.

In the first lecture block, the development of a remote-controlled tugboat for port manoeuvres in the Fern-SAMS project was presented. With the help of Augmented Reality, this remote control is implemented at the CML in an application-oriented manner (see article on the following page).

In the second lecture block, the development of robot applications in

harbours for the investigation of ship hulls, quay facilities and seabed conditions in the RoboVaaS project was explained. At the CML the prototype of an innovative watercraft is built for RoboVaaS, which consists of an autonomous surface vehicle connected with an unmanned underwater vehicle.

And in the third session, the inventor of the Vindskip® presented the current status of the development of the Car Carrier, which aims to reduce energy consumption pragmatically and dramatically at the same time using a drive concept consisting of LNG and wind propulsion through the sailing characteristics of the
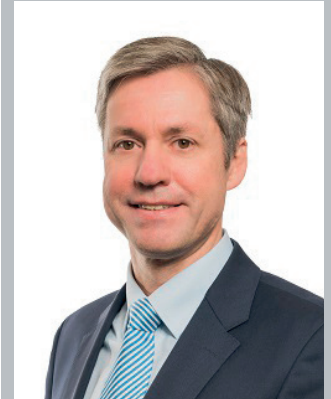
ship's hull. The concluding panel discussion on the hype or potential of digital business models in the maritime sector provided exciting insights and confirmed that it is important to pursue such models.
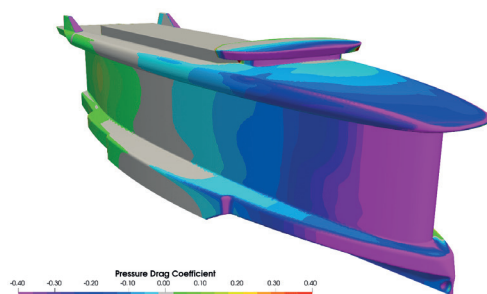
© Lade AS

Approximately 50% of the Vindskip® hull offers additional propulsion (blue-violet bow section), depending on the angle of attack of the apparent wind.

Autonomous vehicles: Interesting times are approaching ports and harbours

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AUTONOMOUS VEHICLES IN PORTS
EXPECTATIONS AND REQUIREMENTS

The Port Planning and Development Committee of the International Association of Ports and Harbors IAPH has asked itself what impact the development of autonomous vehicles will have on ports.

How should ports, understood as the community of companies and organisations operating in them, prepare for the arrival of automated and autonomous vehicles? What are the infrastructural requirements, what knowledge do port administrations and operators need in order to successfully master the challenges? And how can ports play a crucial role in developing and building an environment for autonomous vehicles?

The new study „Autonomous Vehicles' Impact on Port Infrastructure Requirements", which the CML presented at the IAPH World Congress in China at the beginning of May, provides answers. The study gives a comprehensive and critical overview of the technology and development of autonomous vehicles in road, rail, air and sea transport. In addition, recommendations are given on how ports can prepare for future automated vehicles. These include infrastructural and technological requirements, regulatory and data protection aspects as well as considerations for additional services and new business models.

A first overview can be downloaded from the CML website. The complete study is expected to be available there in autumn.

REMOTE-CONTROLLED TUGS IN THE PORT
AUGMENTED REALITY PROMOTES SAFE PROCESSES

Advanced communication and modern control technologies offer new possibilities for water- and land-based manoeuvre coordination. The FernSAMS project - the use of remote-controlled tugboats during mooring and casting off manoeuvres of large ships - takes advantage of this. In the future, unmanned tugs, so-called RoboTugs, will be used to perform these dangerous manoeuvres. The highly qualified personnel will control the tugboat operations from shore and also be able to make more efficient use of today's often long waiting periods.

FernSAMS pursues a holistic approach: all tasks of tugboat operations such as automated line handling, communication and data exchange as well as shore-based support, training of seafarers and manoeuvre optimization through a simulation model are considered in the project.

At the CML, special attention will be paid to achieving a realistic situational awareness in the remote control environment. Through augmented reality visualization, the real tractor field of view is extended by virtual displays, which provide the tug personnel with the necessary information to safely perform the manoeuvres from a land station.

For this purpose, innovative approaches of Augmented Reality using the latest findings from the gaming industry are used. The resulting prototype will then be tested by seafarers.

FernSAMS is funded by the BMWi over a period of three years. Coordinator is Voith GmbH. Further partners are McGregor GmbH, TU Hamburg, BAW Bundesanstalt für Wasserbau, MTC Maritime Training Center Hamburg GmbH as well as Media Mobil Communication GmbH and Fraunhofer CML.
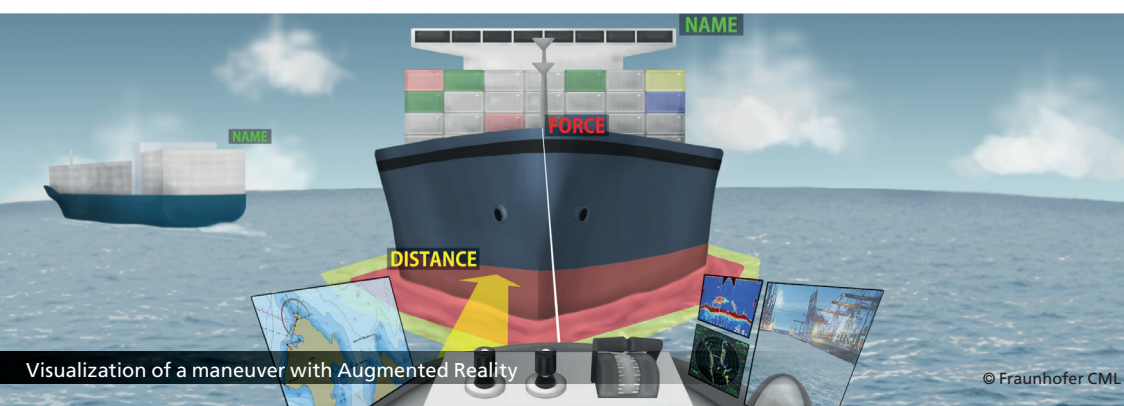
Visualization of a maneuver with Augmented Reality

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