



Worldwide monitoring: the visualization of AIS data illustrates the global shipping routes

## CO<sub>2</sub>-EMISSIONS FROM SHIPS SUPPORT FOR SHIPPING COMPANIES

The EU is collecting all data that can contribute to measurably reducing emissions from shipping in a novel system for monitoring, reporting and verification, the so-called MRV (Monitoring, Reporting, Verification)-system. For each individual ship a specific Monitoring Plan had to be submitted to an independent verifier as early as 2017. And since January 1, 2018, shipowners have been obliged to report the CO<sub>2</sub>-emissions of their ships during their voyages to and from the EU and within European waters. Not only the fuel consumption of the main engine, but also the consumption of auxiliary

equipment, hot water preparation etc. must be taken into account. The first emission reports must be submitted to the EU by April 30, 2019.

This is not an easy task for companies, as there are still no reliable methods for determining CO<sub>2</sub>-emissions. The data sources to be used are documents on fuel deliveries, estimates of fuel consumption on board, flow measurements or direct CO<sub>2</sub>-emission measurements.

In order to support shipping companies in this task, the CML together with the Wismar University of Applied Sciences, the JAKOTA

Design Group, the German Aerospace Center (DLR) and the project manager JAKOTA Cruise Systems is developing a software prototype for calculating CO<sub>2</sub>-emissions. The AIS (Automatic Identification System) data of the ships are used as well as information from the weather service to derive fuel consumption and emissions from speed and external influences. The results can then serve as a reference for the shipping companies' calculations. EmissionSEA is funded by the BMVI over a duration of three years.

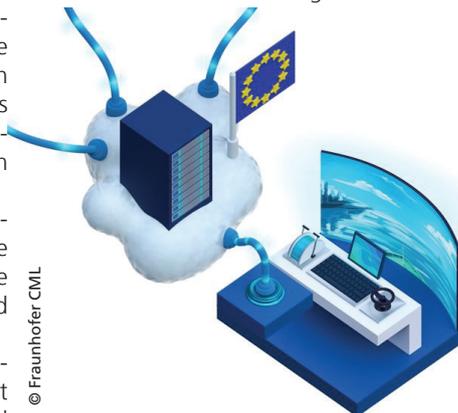
## SHIP HANDLING IN THE SIMULATOR NETWORK GREAT POTENTIAL FOR NAUTICAL SAFETY

Ship simulators enable the setup of realistic maritime situations. Standing on a ship's bridge, a test person can steer a ship of his choice in any sea area. Additionally, wind and weather conditions can be adapted and further ship traffic can be simulated. For the initiators of the European Maritime Simulator Network EMSN this was not enough. For the first time, they connected ship handling simulators from different manufacturers at different European locations. The network of research and training institutions has developed new applications for more intensive communication and improved information exchange in EU-funded research projects. In this way, dangers such as ground

ings or collisions can be indicated at an early stage and sea emergencies can be visualized on the electronic nautical chart. The EMSN can also be used to determine optimized route guidance for each voyage and the ships can share their planned routes with each other.

The simulator network will in future be maintained by the CML and be called EMSN Connect. EMSN Connect already represents almost a dozen international partners and new

partners are welcome. On several dates during the year, they can use the network for realistic test scenarios with a large number of ships.



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Data exchange with EMSN Connect

### FOREWORD



Dear Readers,

*the end of the year calls for a brief pause and offers the opportunity to reflect: what brought us 2018, which successes did we celebrate, which projects inspired us and what do we want to do next year? We particularly remember the successful event of our first „Maritime Innovation Insights“ in May and of course the stand at SMM, where many of you visited us.*

*In this newsletter, we present new exciting projects to you. We are particularly pleased when successful projects can be used to develop and continue our own technology solutions, as in the case of EMSN Connect.*

*And for 2019 we have further growth in mind, both in terms of our number of employees, innovative developments and our new building, for which the foundation stone will be laid in June.*

*I wish you a Merry Christmas and a successful, healthy New Year!*

*Your Prof. Carlos Jahn  
Head of Fraunhofer CML*



Chancen für Terminals: Einsatz von Augmented Reality

## TRIMODAL TERMINALS IN SEA AND INLAND PORTS COMPETITIVE ADVANTAGE WITH AUGMENTED REALITY

Augmented Reality (AR) stands for the provision of supplementary information to a work assignment, e.g. in the field of vision of data glasses. In recent years, AR has simplified and improved conventional work processes and created new applications. In order to transfer this technology to the complex processes in trimodal terminals, the project „InnoPortAR - Innovative Fields of Application for Augmented Reality in Inland and Seaports“ coordinated by Duisburger Hafen AG has been launched at the CML. Together with the project partners Fraunhofer IML, Materna AG and Materna TMT as well as the associated project

partners Haeger & Schmidt, CTD Dortmund and Eurogate Technical Services GmbH, practical tests will show which workflows can be supported in inland and seaports by the use of AR. The project is funded by the BMVI within the framework of the IHA-TEC research programme over a period of three years. The AR applications are to be tested in various environments, for example in container handling in trimodal terminals, in maintenance and repair as well as in cargo securing. Through these solution approaches, „InnoPortAR“ will contribute, among other things, to improving human-machine interaction through the targeted

provision of relevant information. The CML is especially involved in the requirements analysis, the transferability of project results as well as the scientific exploitation. Concrete InnoPortAR innovations will be developed for the „maintenance and repair of handling equipment and port infrastructure“. The implementation concept for a seaport operation will be implemented exemplarily with the project partner Eurogate Technical Services GmbH.

## DIGITIZATION OF THE MARITIME TRANSPORT CHAIN: MISSION DEVELOPS BARRIER-FREE SOLUTIONS

International goods and transport flows are triggered and accompanied by information flows. These information flows are not yet seamlessly connected, as the connection of different IT systems and data structures as well as existing security concerns have made such projects difficult to impossible. The new research project „MISSION - Manage Information Seamlessly in Ports and Hinterlands“ at the CML, funded by the national IHATEC programme for innovative port technologies, draws on new technologies and intends to develop a non-discriminatory infrastructure for information exchange and networking as well as pilot applications over the next three years. The basic idea is to identify relevant information and make them available to the participants in a clearly defined form. For this purpose, an IT module will be used which mediates between data owner and user and provides relevant information

for successful data transfer. In this way, the data is not stored centrally but remains with its owners. The tasks of the CML include the selection and provision of the IT infrastructure for the data transfer. A number of requirements apply, from the secure authentication of participants, the definition of a variable data format to compatibility with different interfaces. Compliance with high security standards is an important prerequisite, as is subsequent transferability to other fields of application. The implementation of the MISSION infrastructure and applications has the potential to increase the transparency of the transport chain and improve

its efficiency and flexibility to the benefit of all participating companies. MISSION is managed by the Lübecker Hafengesellschaft and, in addition to CML, Lufthansa Industry Solutions and the University of Lübeck are other project partners.



### IN BRIEF

The **Maritime Data Space** aims at a comprehensive data networking for innovative digital applications in the maritime industry. The greatest possible data security and the retention of the data by the companies are fundamental building blocks of the concept. A workshop on November 13, 2018 at the TUHH presented the idea, which is being promoted by the Fraunhofer IGD from Rostock, the CML and the Maritime Cluster Northern Germany.

The second **Maritime Night** on November 10, 2018 at the TU Hamburg again attracted many visitors to the campus in Harburg, whose buildings were festively illuminated. The digital planning table was shown at the CML, where visitors can put together an individual terminal in a short time. In addition, the ship simulator was once again a crowd-puller, this time allowing visitors to steer an approach towards the Great Belt Bridge.

### +++DATES+++

- **1st regional meeting Erfa-KV**, January 23, 2019, Hamburg
- **Digital Ship Maritime CIO Forum**, February 20, 2019, Hamburg
- **Maritime Innovation Insights**, May 9, 2019, Hamburg

### IMPRINT

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