Fraunhofer CML

30th SMM

Hall **B6**
Stand **327**

Fraunhofer Center
for Maritime Logistics and Services

News 3.22

Opportunities for Maritime Industry through Innovation: Fraunhofer at SMM

At this year's 30th anniversary of the SMM from September 6-9, 2022 in Hamburg, the Fraunhofer-Gesellschaft will again provide insights into innovative customized solutions for the maritime industry. Together with eight other Fraunhofer institutes, the CML will present a joint stand in hall B6, booth 327. There, new technologies will be shown that provide answers to the currently pressing industry topics of digitalization, automation, environmental efficiency, and Industry 4.0. Among other things, visitors can look forward to a variety of exhibits from the Fraunhofer CML:

▪ The MESU box is a special example of a cost-effective measurement technology for ship emissions. With its measuring sensors for nitrogen and sulfur, among others, it can not only record the emission components of an exhaust gas stream on board, but also the sum of all emissions and immissions in the immediate vicinity. In addition, the recorded data is combined with the current GPS position.

▪ SCEDAS is an advanced software solution that supports crew planning in terms of efficiency and accuracy. Mathematical optimization enables crew planners to set up highly detailed schedules for seafarers.

In addition to these examples, other research projects of Fraunhofer CML and the other Fraunhofer institutes will be presented. We look forward to welcoming you at our booth.

Furthermore, Fraunhofer CML experts will participate in panels and discussions.

Also take a look at our homepage and social media channels to not miss any current infor-

# Digitalize efficient Maritime Operations with SeaML:SeaLion

One exhibit to be experienced at SMM 2022 is SeaLion: the prototype of an autonomous surface vessel (ASV), which with its size of 2.2x1.5 meters is a highly modular research platform for a wide range of maritime applications. SeaLion offers a large amount of solutions for the maritime industry.

It is possible to integrate various robots, sensors, platforms and camera systems, which makes SeaLion a real all-rounder: For example, the unmanned catamaran can be equipped with a launch and recovery system (LARS) for remotely operated vehicles (ROVs) or a landing platform for unmanned aerial vehicles (UAVs) including a hot-swap battery system. A total payload of 120 kilograms is available here.

Whether above or under water, near the coast or in a port, the autonomously moving platform can be used to carry out a wide range of maritime service tasks (for example, ship inspection) or for research purposes - at a speed of up to 11 knots and with high stability. Jobs can be assigned to the robot via the scalable and web-based user interface (WebUI). At the same time, WebUI enables secure data processing and monitoring, as well as operation from any device and location. SeaLion also features an on-board AI computer, has a range of 250 kilometers and a battery capacity of around 24 hours.

An autonomous platform for a wide variety of robotics solutions: Fraunhofer CML provides support in the design, development and deployment for your company's projects and requirements, so that SeaML:SeaLion can be tailored specifically to your individual needs.
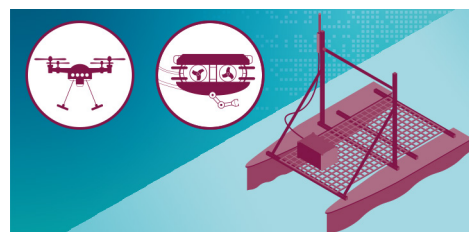

Preface

Dear Readers,

After four years, we are particularly pleased to be able to exchange ideas with you in person again at the world's leading maritime trade fair SMM. This newsletter is completely dedicated to SMM and informs you in advance about our most important exhibits and their practical benefits:
For example, the autonomously driving research boat SeaLion offers a wealth of solutions for the maritime industry through its ability to integrate various systems and platforms.
In the field of virtual and augmented reality (VR and AR), there are numerous highly interesting areas of application. VR goggles, for example, can be used to train rescue maneuvers in detail and close to reality. You can also learn how AR can be used to remotely control unmanned tugboats - an exciting topic, especially in times of a shortage of skilled workers.
Read about these and other topics in this newsletter and feel free to visit us at our booth to learn about even more research projects. We are looking forward to the conversation and the intensive professional exchange with you.

Prof. Carlos Jahn
Fraunhofer CML
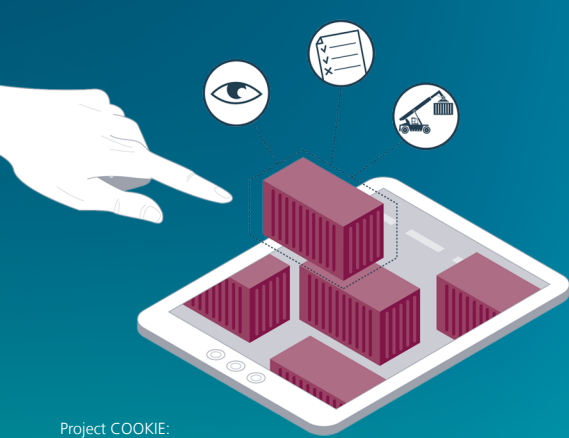
Project COOKIE:
Visual control of containers

Project SCEDAS:
Optimization of Ship Operations

Virtual Worlds more realistic than ever: Practical Use of Virtual and Augmented Reality

VR and AR applications are continuously gaining relevance in the maritime industry - because the potentials are obvious.
Among other things, the technologies offer opportunities for advanced training, innovative forms of communication or modern control technologies - and with entirely new standards in terms of safety and efficiency.

With the virtual Fast Rescue Boat, Fraunhofer CML is presenting an example of this at SMM. VR glasses are used here as part of training units for seafarers. The learners operate in a virtual world and are thus unbound by time and place. The Fast Rescue Boat application is used to train the maneuvers involved in operating a respective unit.
The nautical personnel can simulate the individual work steps, such as the rescue of a POB (person-over-board) realistically and train safely. A particular advantage is the game character, the so-called gamification - this makes the application intuitive and increases motivation and learning success.

Researchers at Fraunhofer CML and project partners from industry and science are exploiting the possibilities of AR in the FernSAMS project, among others.
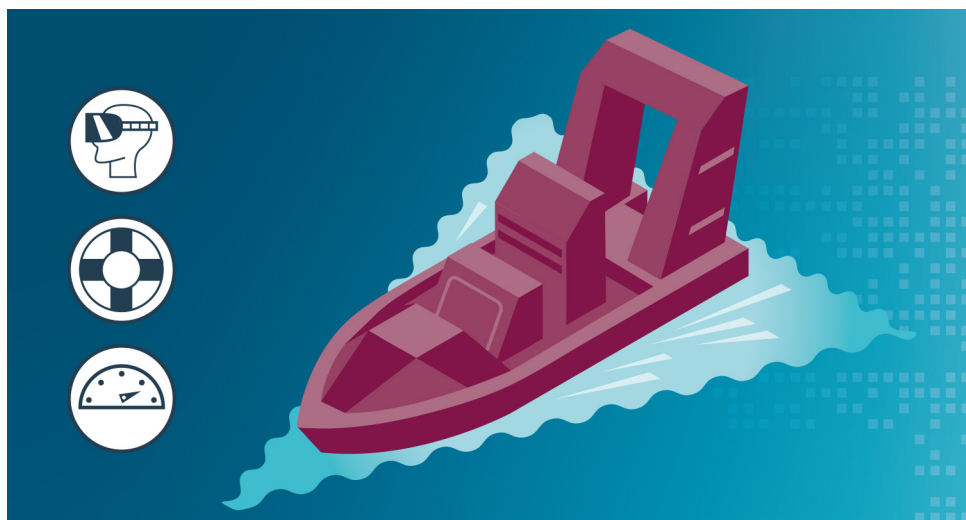
The project involves the use of remote-controlled tugboats for docking and casting off maneuvers of large ships, which in practice to date have been personnel-intensive and also not without danger.

In the future, this could be done by so-called RoboTugs as unmanned tugs that are controlled by experienced tug personnel using AR.
As with the Fast Rescue Boat, the focus here is on achieving realistic situational awareness during the control of the tug. The normal tugboat field of view is enhanced by the AR application, which supports safe execution of the maneuver.

Complex maneuvers such as lifeboat operations or berthing and unberthing maneuvers will not be fully autonomized in the near future.
But VR- and AR-supported methods and processes can nevertheless enable the maritime industry to take a decisive step toward digitization and automation.

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