

## Reinventing VHF maritime traffic: Fintraffic and Fraunhofer CML put AI to work



*Hamburg, 05 April 2023* - Together with the Fraunhofer Center for Maritime Logistics and Services (CML), Fintraffic's Vessel Traffic Services (VTS) has launched a research project to further develop VHF maritime radio traffic using automatic speech recognition. In the future, a voice recognition system using artificial intelligence (AI) will convert and provide real-time voice radio traffic in text form to Fintraffic's vessel traffic centers. This will support the correct interpretation of messages, especially in extraordinary situations.

"Fintraffic's Vessel Traffic Services will be on standby around the clock for the VHF radio system that covers the whole coast of Finland. The VHF talk radio is one of the central tools at our Vessel Traffic Centres. The recent marine VHF traffic-related development work enables connecting machine learning artificial intelligence alongside traditional radio traffic which we are now going to research further in Finland," says Olli Soininen, program manager at Fintraffic's Vessel Traffic Services.

"In the research project which is starting now, we will investigate the suitability of utilizing artificial intelligence and automation in Finland's VTS. We will also build a proto model on a national level and use it to test automatic speech recognition as a support for normal radio traffic, among other things," continues Mika Nyrhilä, project manager at Fintraffic's Vessel Traffic Services.

Fintraffic's Vessel Traffic Services aims to test this prototype as early as 2024. In addition to the VHF voice recognition model, the development project will provide a basis for creating one-way VHF voice announcements with a speech recognition software that uses real-time vessel traffic situational pictures. The automatic transmissions created will be tested for the first time in navigational warnings of the Finnish coastal radio station Turku Radio in 2024.

**Artificial intelligence for correct transcription even under difficult conditions**

The research project combines the Fraunhofer Center for Maritime Logistics and Services' (CML) previous experience in speech recognition with Fintraffic's expertise in the operation and specifics of maritime VHF communication.

"There are multiple things typical to maritime communication, which make understanding and receiving messages more difficult. Oftentimes, there is engine noise drowning out speech, and crews are made up of individuals from various countries with their own accents and dialects. These are all issues that need to be solved in order to improve maritime communication," says Maximilian Reimann, research associate at Fraunhofer CML.

In maritime transport, the VHF voice radio system has been used for decades for communication between ships and ports. With the VHF radio, ships can establish a direct voice connection with a coastal station or another ship, as well as contact emergency services. The importance of the system to vessel safety is such that it is mandatory on all major ocean-going vessels. However, the quality of VHF communications at sea is affected by several factors. Among other things, the distance between sender and receiver, antenna heights and their condition, and varying meteorological conditions can affect the clarity of the message.

### **Fraunhofer CML**

The Fraunhofer Center for Maritime Logistics and Services CML develops innovative solutions for the maritime sector and the maritime supply chain. We support companies and institutions from shipping, port management and logistics in initiating and implementing future-oriented technologies and processes.

Starting from everyday challenges, our interdisciplinary teams develop customer-specific solutions for private and public clients. In the four research fields of Maritime Logistics, Port, Shipping and Autonomous Maritime Systems, our employees transfer the latest scientific findings from the diverse research activities into practice-oriented applications. The focus is on solutions for end-to-end digitalization and process automation, service concepts, and AI-supported data analysis, as well as autonomous maritime systems and sustainable shipping. The innovative concepts are tested and improved at the CML through simulation, models and in real operation.

Fraunhofer CML was founded in 2010 as part of the Fraunhofer Institute for Material Flow and Logistics IML in Hamburg.

### **Fintraffic VTS**

Fintraffic provides and develops traffic control and management services in all forms of traffic, ensuring safe and smooth traffic in Finland in a responsible manner.

Vessel Traffic Management provides Vessel Traffic Service (VTS) to merchant shipping and other maritime traffic and maintains safety radio operations. In Finland, Vessel Traffic Services are provided by the three VTS Centres of Fintraffic's Vessel Traffic Services. The Centres' surveillance areas encompass all coastal merchant shipping lanes and the Saimaa deep fairway. The goal of the Vessel Traffic Service is to improve the safety of marine traffic and facilitate the efficiency and free flow of vessel traffic. It also aims to prevent accidents and mitigate their potential environmental hazards.

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