

Traffic Analysis in the Rhine-Ruhr Metropolitan Area

Maximilian Kaster B.Sc., Dr.-Ing. Jens Neugebauer, Prof. Dr.-Ing. Bettar el Moctar, Universität Duisburg-Essen, Institut für Schiffstechnik, Meerestechnik und Transportsysteme, Duisburg, Germany, maximilian.kaster@uni-due.de

Abstract

Suitable full-scale test fields are important for the development of remotely operated and automated inland ships as well as assistance systems for ships. Test fields are supposed to provide a certain level of infrastructure, e.g. high-speed mobile network, a reasonably safe space, in which deviations from standard ship operations can be tolerated but should also offer the chance to test the developed systems under realistic conditions. In this context, realistic conditions concern the state and characteristic of the fairway but moreover the traffic situations opposed to the tested system.

The test field Rhine Ruhr consists of the Dortmund-Ems Canal between the port of Dortmund and the Waltrop lock. From there, it is linked to the Rhine via the Rhine-Herne Canal and the Wesel-Datteln Canal. In the course of the project FernBin, which deals with the development of a system for the remote operation of inland ships, anonymized data from the Automatic Information System (AIS) of inland ships in the mentioned region is acquired. The data is used to analyze the behavior of ships in different traffic situations. This delivers e.g. the space which is typically required for a certain maneuver at a certain place. Training AI models is also possible using this data. However, the AIS data also provides information about which ship types and how many ships operate in the region. Moreover, details about their operation can be depicted. This is of particular interest for the design of test scenarios. The presentation provides an analysis of the traffic situation in the Rhine-Ruhr metropolitan area including the mentioned test field. The traffic is analyzed in representative river and canal sections with special attention on the use of the sections during full scale testing of remotely operated and autonomous ships.