



PROJECT ACRONYM AND TITLE: Enhancing path and route planning methodology in passage planning (ENPR)

FUNDING PROGRAMME: Call for funding of Institutional research projects of the University of Rijeka financed from source 581 – Recovery and Resilience Mechanism (University of Rijeka, Institutional Research Projects)

PERSON RESPONSIBLE: Davor Šakan

Project total cost	22.822,43 EUR
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SUMMARY AND OBJECTIVE: Passage planning is the process of determining the safe and efficient movement of a ship or vessel through the environment. The path is one of the route elements, an important part of passage planning based on the established methodology with navigational constraints and human interpretation. However, technological developments open the possibility of automated solutions with different planning levels for varied vessels and ships. Therefore, there is a great research interest directed towards the creation of automated methods of global path, trajectory, or movement planning in a static environment, i.e., before the start of the voyage. However, in these efforts, sources of navigational information such as electronic navigational charts (ENC) or constraints from classic passage planning are not significantly implemented. This is important given the common sharing of the navigation environment of ships and vessels with various levels of control, decision support and automation in the short and medium terms.

The main objective is to improve path and route planning methodology using modern technologies and classical planning methods. Therefore, an object-relational database with ENC objects suitable for creating a multi-resolution discrete model of the environment. The path and route will be determined by the settings and constraints from the classic passage planning. Discrete search algorithms will be applied to determine the path, with a thorough analysis of the possible application of hybrid solutions. The path and route applicability in navigation will be ensured by removing redundant waypoints and path smoothing. The obtained path and routes will be validated by comparing the similarities with the ship movement data and in the navigational simulator. The implementation of the project shall result in an improved methodology of path and route planning applicable to passage planning and other research interests.

Start date	End date
1 October 2025	30 September 2029