

Graduation project summary

This document includes a short description of the graduation project for my double degree at the TU Delft. Combining both my maritime knowledge and computer science knowledge during a project at Damen Shipyards. The project is worth 60 ECTS, of which 30 ECTS is common and 15 ECTS per degree. The responsible supervisors at the TU Delft are:

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Computer science becomes more relevant for the maritime industry, as more data is generated and stored. This involves software architecture, testing and cyber security. But what interests me is how the developments really support the desires and needs of the people using the software and data. What do they need to develop, design, sail or sell innovative ships? Projects relevant in the nearby future are predictive maintenance, autonomous vessels, development of sales strategies, and the generation of ship configurations. To make these projects a success, it is all about information and data. A variety of data types, data sources and databases should be coupled. This must be done in such a way, that the right data is at the right person at the right time, format and place.

During my graduation project, I want to develop a tool. Research will be done on which information should be available in a specific case, how the data will be acquired, stored and retrieved for usage. To make this project specific, realistic and doable within the time. I will first consider a specific use case. Extending the tool further depending on the availability of time. To guide this process several milestones are defined beforehand. During the project is determined which are realistic to achieve. The initial milestones are:

- Predict safe area in front of a specific ship
- General tool to predict ship dependent warning domain
- Warning system for crew to inform them about situation and needed awareness
- Framework based on the tool to support more features, such as:
 - Warning signals for maintenance
 - Enable fleet management to supervise and set targets for captain

Requirements for the computer science part are the development of the tool, which will be evaluated. The tool can only be developed when there is knowledge on the input (data acquisition and database usage) and the output (user interface and visualisation of the data). In an iterative process the tool will be improved, this is among other things based on evaluation tests.

The maritime technology part will be more related to the models behind the tool. Currently the warning domain around a ship is loosely related to the type and size of the vessel, research will be conducted on this subject. To determine for each specific vessel the safe area, which depends on length, vessel type, weather, etc. Depending on the progress of the project, is it possible to cooperate on current research for predictive maintenance and fleet management.