Master Thesis & Internship (Automation): MPC based foiling boats attitude control

In collaboration with SHIPMAR

Purpose of the thesis:

The project is focused on the development of an attitude controller of an **electric boat** equipped with a ***foil***: the main foil is located at about half of the hull and allows the boat to float with a significant ***reduction of energy consumption***. By managing the angle of attack of the foil it is possible to control the vertical thrust necessary to maintain the immersion/emersion altitude in an optimal operating range. In order to control also the pitch angle of the boat, it is possible to use additional variable-angle foils connected to the rear engines.

The objective of this project is the design of a control system able to control the vertical emersion quote and the pitch angle, operating on the foils angles, optimizing the emersion phase at set speed. A "digital twin" of the system will be developed with the collaboration of the partner company, to be used both for the realistic simulation of the behavior of the boat, and for the control with a **Nonlinear MPC strategy**.

A close interaction with SHIPMAR and **experimental testing** are expected. The activation of a **post graduate scholarship** is also foreseen.

Duration:

6-8 Months

Info:

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WORKBOAT
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