

# Autonomous Boat

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## **The need:**

This project is in collaboration with Maine Maritime Academy and is focused on the position and dynamics of a small autonomous boat. Previously boat design, in particular sea keeping and heave, have been driven by safety and comfort demands of the passengers. The entire design space for boat design has been changed by the introduction of autonomous boats. By eliminating the human factor in design it is possible to design boats that no longer work for human passengers but are designed only for efficiency and performance. This means that can be designed for conditions that are not well characterized in existing design codes.

## **The key project design objective:**

A small autonomous boat will be designed which is not expected to be suitable for human passengers. This boat will show characteristics which may enhance performance and efficiency but which are not well understood in the design codes. The key element of the project will be a controls system which will drive the boat in a simple path and log the position, velocity and sea keeping of the boat (angles, angular velocity and angular acceleration in all three axes).

## **Who is the final customer for this device;**

This will be done for the use of Dr. Doug Read and Maine based naval architects who are interested in working on boats that have been designed from the ground for autonomous use.

## **Who will be supervising and evaluating the outcome of the project:**

Project review will include oversight by Dr. Doug Read of Maine Maritime Academy,

## **UMaine Mechanical Engineering technical contact point:**

Professor Peterson will supervise the mechanics, materials and manufacturing issues related to the project and will serve as an interface with outside entities. Outside technical support will be available for the evaluation of this project.

## **The core Mechanical Engineering classes required as background for the project:**

Controls  
Lab I & 2  
Design I & II  
Dynamics  
Fluids

## **Resources available:**

This project is unique in that a wide range of people and equipment can be provided for the project. While the applications of the technology are quite broad, the immediate support for this project is from the Maine maritime industry.

### **End of year deliverables:**

The design will require a clear starting design proposal which will include methods to be employed in the design or modification of a simple hull and the use of advanced data acquisition for monitoring the sea keeping of the boat. Drawings and complete control system design and justification will be required for an initial approval. The completion of a hull and the associated control and data acquisition electronics are critical to this project.