

# Autonomous Sailboat Project: System Overview

A Computer Engineering Research Project

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## Background:

- Worldwide interest in development of autonomous sailboats
- Annual competitions in both freshwater and long-distance ocean races (i.e. Microtransat, World Robotic Sailing Championship and Sailbot competitions)



ASV Roboat  
(www.roboat.at)



MOOP and BeagleB at the WRSC  
(www.aber.ac.uk/en/cs/research/ir/robotu)

## Project Goals:

- Build a research platform to begin work in autonomous sailing vessels
- Establish a set of components necessary for an autonomous sailing vessel

## Hull Characteristics:

- Mini-12 racing class
- length: 1.14 m.
- draft: 21.6 cm.
- weight: 0.45 kg.
- combined sail area: 0.34 sq. m.

## Sensors:

- global positioning system (GPS)
- potentiometer-based wind vane
- 3-axis tilt-compensated compass
- web camera



Potentiometer-based wind vane  
(www.aber.ac.uk/en/cs/research/ir/robots/arv)



OSS000 tilt-compensated compass  
(www.ocean-server.com)



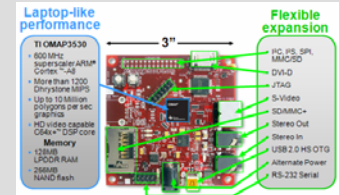
Pharos GPS  
(www.pharosgps.com)

## On-Board Computing:

- BeagleBoard Single-Board-Computer
- 600MHz OMAP3530 processor
- 128MB LPDDR RAM / 256MB NAND flash
- Angstrom operating system



BeagleBoard SBC  
(www.beagleboard.org)



BeagleBoard specifications and layout  
(www.beagleboard.org)

- Arduino  $\mu$ C for motor control and interface for select sensors



Arduino  $\mu$ C  
(www.arduino.cc)

## Actuators:

- sail servo (torque: 19.8Kg\*cm, operating speed: 0.19sec/60°)
- rudder servo (torque: 3.5Kg\*cm, operating speed: 0.14sec/60°)

## Off-board Communication:

- Wireless LAN

Expected Maiden Voyage Spring 2010

