

MAE 434W/435
Senior Design Project Fall 2014-Spring 2015

Title:

Autonomous Surface Vehicle

Description:

Our goal for the Old Dominion University (ODU) Autonomous Surface Vehicle (ASV) team is to build upon the design of previous years to allow ODU to competitively compete in the [8th Autonomous Unmanned Vehicle Society International -- Autonomous Surface Vessel competition \(AUVSI-ASV\)](http://www.auvsi.org/competition/2015). The 2015 event is slated to be held on Founder's Inn & Spa in Virginia Beach. This year's team includes students from the Mechanical and Aerospace and Electrical and Computer Engineering department. It will be the fifth year that a team from ODU will compete. The Facebook link for the team activities is below

<http://www.facebook.com/pages/Old-Dominion-Universitys-ASV-Team/165204296920068>).

The project is multidisciplinary in nature which requires knowledge in vehicle control (navigation, dynamic positioning, data fusion and motion stabilization), obstacle detection and avoidance, system integration, manufacturing and payload management. In this year, the project team will be made of students from ME and ECE. Students from MAE will be responsible for build, power and control a surface vehicle that can autonomously navigate through buoys and accomplish many designed required tasks based upon sensor data collected from lidar, light sensors, acoustic sensors, GPS, IMU, etc. The Arduino boards and accessories will be the main devices used for control and data transmission.

In addition to technology challenges, this project offers a real world experience in cross-team collaboration and system integration.

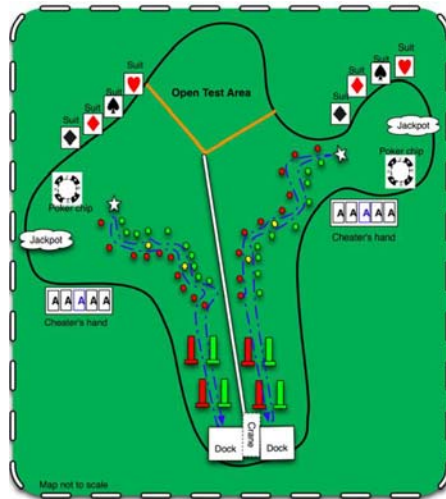


Fig. 1. The Course for ASV Competition



Fig. 2. Quadcopter for Target Searching



Figure 3. ODU ASV in Action

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Figure 4. View from Webcams Mounted on the ASV during Competition

Is this project multidisciplinary? If so, with what department(s) will you be collaborating? Please note if you are looking for a collaborator.

As stated in Description. ECE is our collaborator. Students from ECE will focus on building a quadcopter that will can launch and land on a moving ASV. The quadcopter has to communicate with and serve as the “eye” of the ASV. It is responsible for mapping and path finding using computer vision.

Number of students needed:

Expectation is very high for those participating in the project. Since the competition will be held in July, strong commitment is required.

Required Skill Set for the Team – Smart and Resourceful, Web Design, Team Organization, Project Management, C++ Programming, CAD Drawing, OpenCV, Communication Protocols. **It is strongly recommended to take MAE 495 Intelligent Machine class to be a member of the team.**

Suggested by (Faculty):

Gene Hou
C H Chen

Supervised by (Faculty):

Hou (MAE)
Chen (ECE)