

2018 RoboBoat Competition

Task Ideas

Notice to RoboBoat Teams

- Initiation of introductory competition course.
 - Basic training for new teams
 - Individual task execution
 - Algorithms developed can be refined and utilized in advanced course
- Safety rules and regulations shall be strictly enforced.
 - Harness or sling for lifting and towing
 - E-stop systems both software and wired (must have a hardware solution)
 - Safe vehicle transport on site
 - Enough team members present to maintain safe operations
- Change from 'Journal Paper' to a Technical Design Report.
 - Technical Design Report shall be due no later than 5 June 2018
- Optional Research Paper for RobotX Forum and potential Journal publication.
 - Research Paper topic and submission process to be announced at a later date

2018 Introductory Course – Circumnavigation

- Using the ASV, teams collect Global Positioning System (GPS) data at each buoy and then circumnavigate the buoys.
- Buoys shall be circumnavigated in a prescribed sequence. Teams will be notified of the sequence each day. For example: Green, Red, Blue, and Yellow.

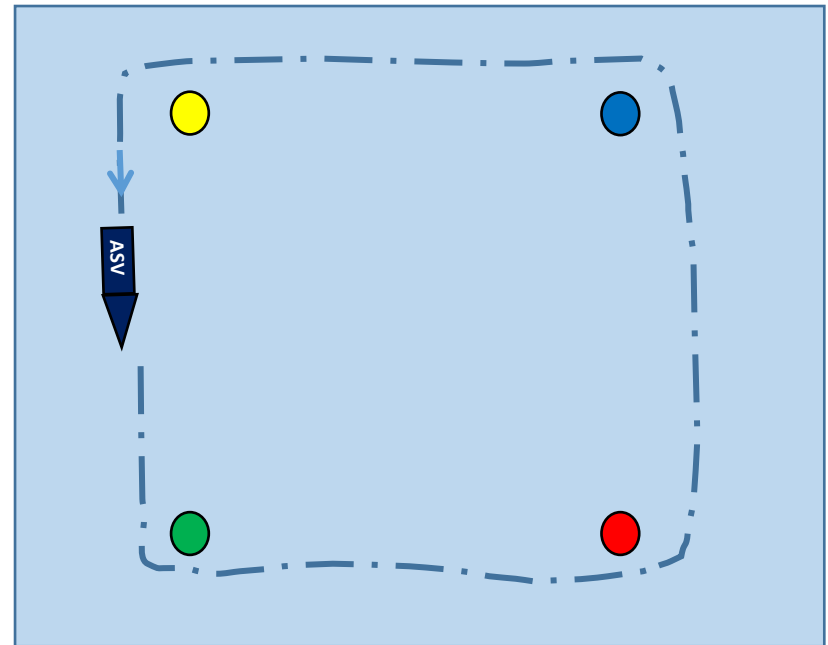


Illustration only

2018 Introductory Course – Maintain Heading

- ASV shall navigate through a set of buoys from Start to Finish.
 - Teams are allowed to use any set of autonomous behaviors to navigate through the gates (Vision, Path Planning, Obstacle Detection and Avoidance, Heading hold, or a combination of any of the above).
- Provided image is an illustration only and not indicative of the final layout.
 - Buoy color, size and shape, and orientation is subject to change.

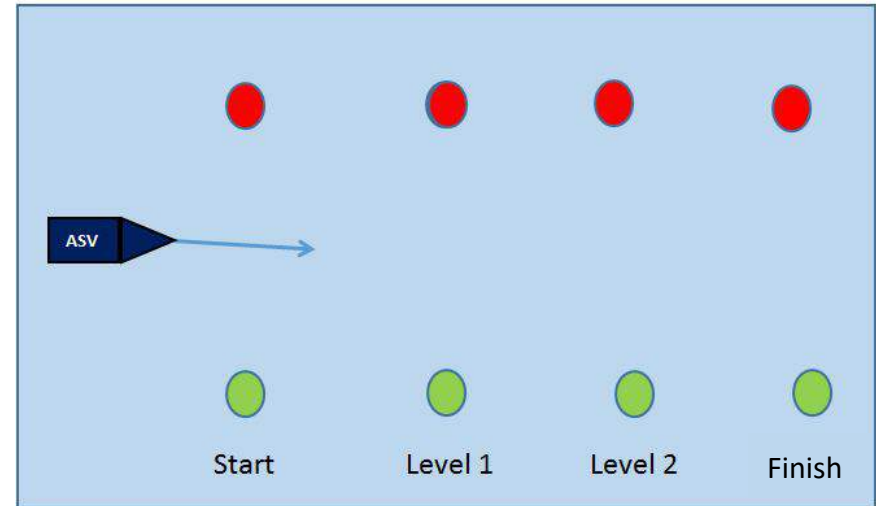


Illustration only

2018 Introductory Course – Slalom Maneuver

- ASV shall use vision system to identify and avoid the buoys.
- ASV must traverse the course, circumnavigate the white can buoy and return to the start point.
 - When traversing to and from the white can buoy, USV must remain to the Starboard (right) side of the red buoy, and to the Port (left) side of the green buoy.

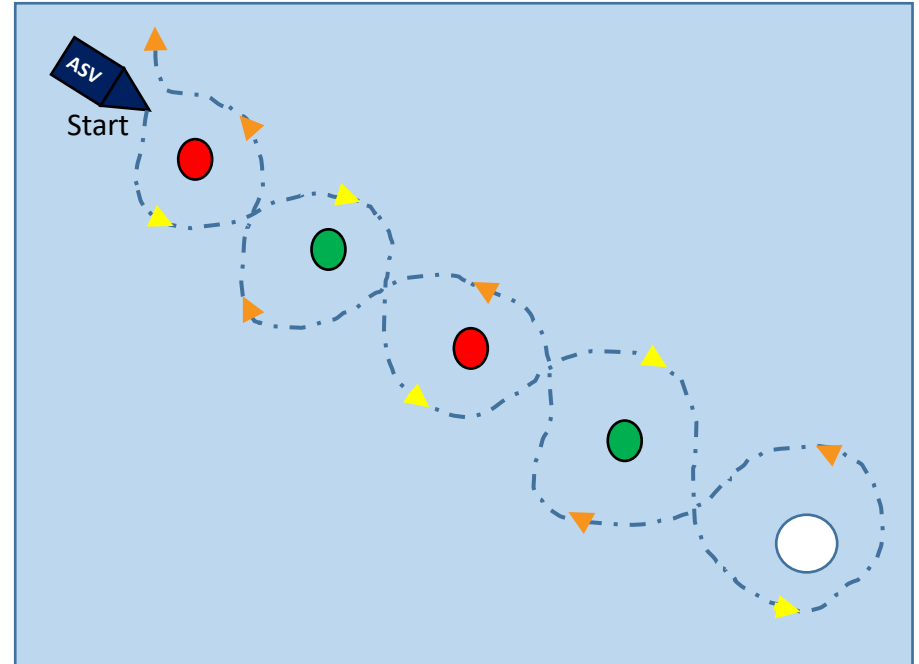


Illustration only

2018 Tasks – Autonomous Navigation (mandatory)

- Autonomous Surface Vessel (ASV) must autonomously pass through both sets of gates without touching the buoys.
- Vehicle must start its autonomous navigation, a minimum of 6' before the first gate.
- Successful completion of this task (once daily) is necessary to attempt advanced mission tasks.

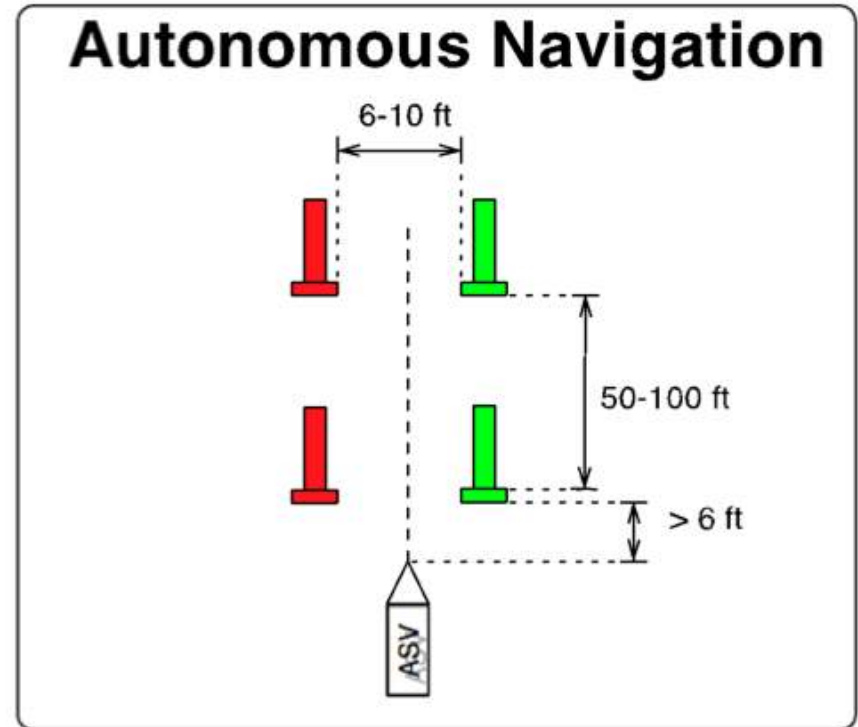


Illustration only

2018 Tasks – Speed Challenge

- ASV enters through the gate buoys, identifies the blue buoy, circles it and exits through the same gate buoys.
- Task must be performed as quickly as possible to demonstrate quality of path planning, maneuvering capability, and hull and propulsion system design.

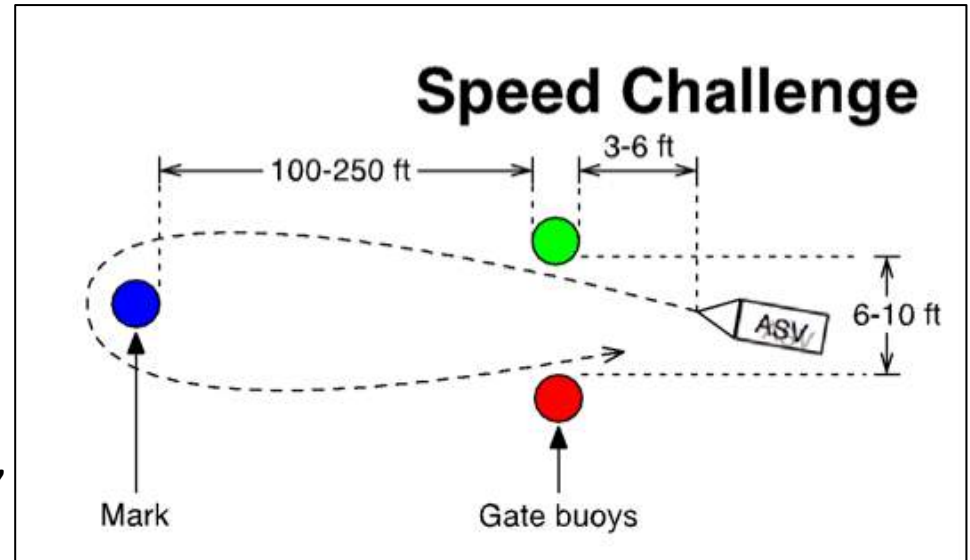


Illustration only

2018 Tasks – Automated Docking

- ASV executes a docking maneuver, based on active underwater acoustic modem and then departs dock.
- ASV autonomously deploys an Unmanned Aerial Vehicle (UAV) to identify randomly generated character displayed on 7-segment module (a, b, c, or 1, 2, 3).
- Character displayed is reported and also denotes the second docking station.
- ASV docks in second dock.
- ASV autonomously recovers UAV.

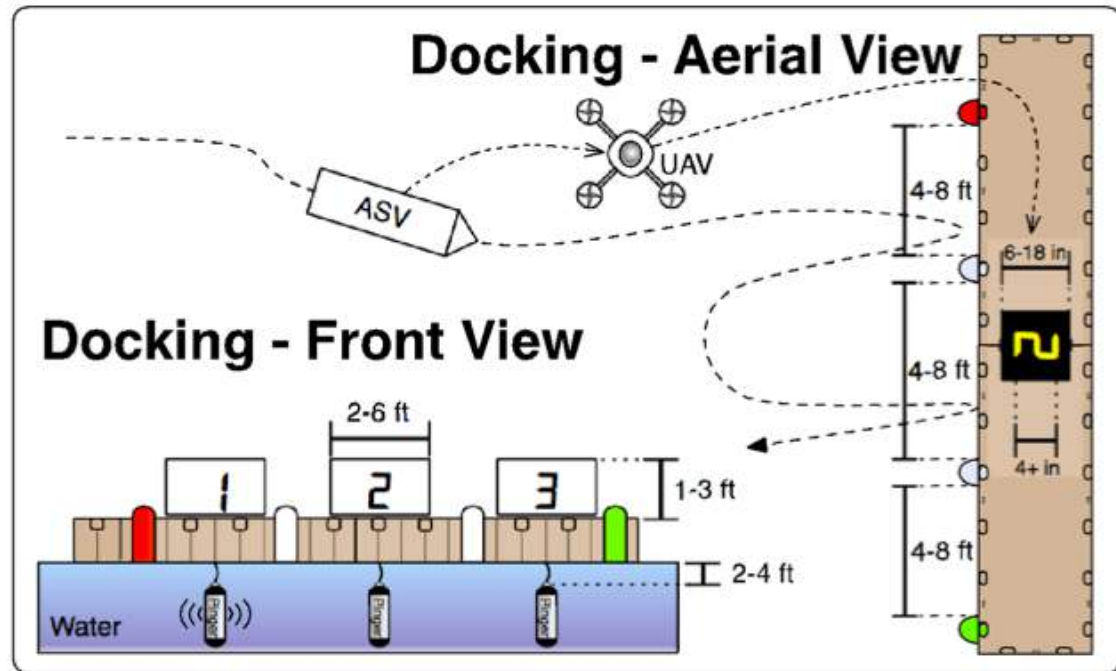
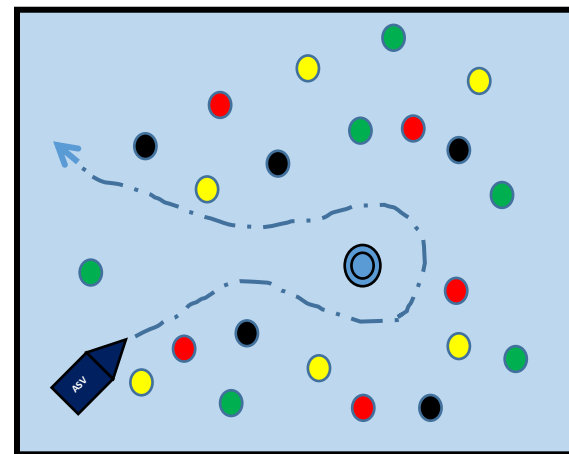
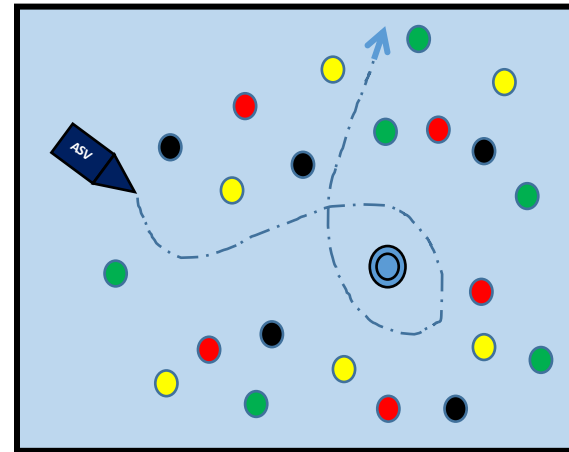


Illustration only

2018 Tasks – Find the Path

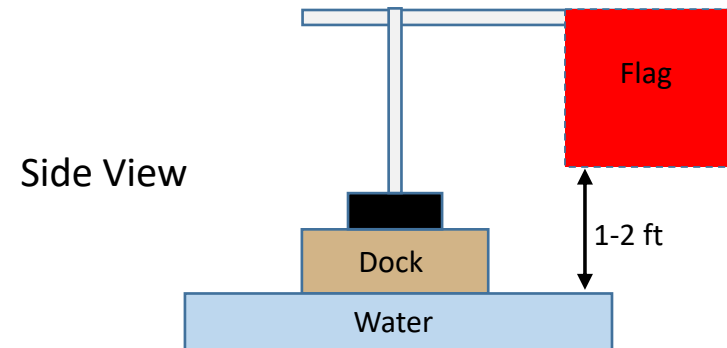
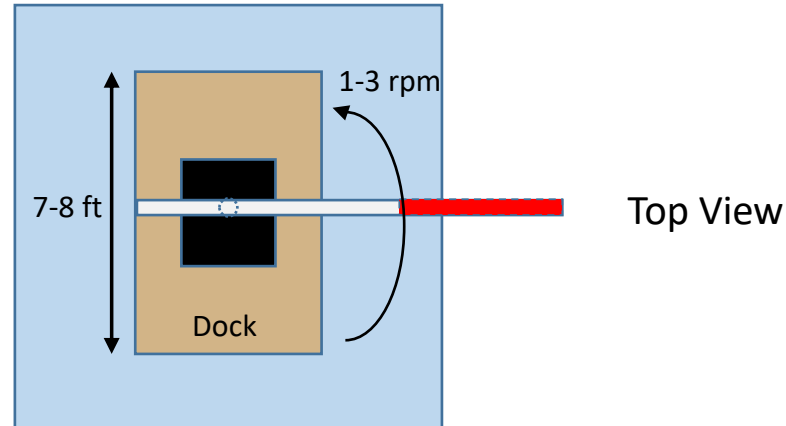
- ASV must find an opening in a field of obstacles, and without touching any of the buoys, enter the field.
- Once inside the field, vehicle must circumnavigate (a minimum of 360°) a can buoy, located in the center of the obstacle field.
- ASV must find a path out of the field of obstacles without touching any of the buoys.
- No fixed entry or exit points (as shown in illustrations).



Illustration's only

2018 Tasks – Follow the Leader

- ASV must identify and detect the colored flag.
- Based on response from Directors server, vehicle must follow the flag, while circumnavigating the task.
- Vehicle must not hit the flag or any part of the obstacle.



Illustration's only

End