

17th annual

RoboBoat 2024

February 5-11, 2024 | Nathan Benderson Park | Sarasota, FL

Primer & Task Ideas



Ducks Overboard

The tasks your boats will be challenged with this year have been inspired by the “Friendly Floatee” event of 1992, when 28,800 spill of rubber toys, including ducks and other animals, spilled overboard a cargo ship.



[Glossary:](#)

ASV = Autonomous Surface Vehicle





Why RoboBoat?

- Increase technical proficiency;
- Establish valuable professional connections; and
- Enjoy learning and collaborating while advancing the technology of ASV systems.

The nominal winners are teams that score the most points. The real winners are participants who learn lasting lessons about working together to create an autonomous system to accomplish a challenging mission in a complex environment.



17 years

Surface Vessel
Full Autonomy
Acoustic Navigation



- **Objective:** Build an international community of innovators ranging from high school to higher education, capable of making substantive contributions to the maritime field and pushing development of small-scale (X-Class) Autonomous Surface Vehicles (ASV).
- Teams must be comprised of:
 - 75% or more full-time students (college and/or high school)
 - Three (3) team members are required to travel to competition
- Participation in the RoboBoat Competition includes:
 - Building an ASV to compete, following RoboBoat's vehicle and safety requirements.
 - Providing a design documentation discussing the team's technical design and competition strategy.

Find out more.

Contact RoboNation at autonomy@robonation.org



What next?

Continue reading through the **CHALLENGE** presented to RoboBoat teams this season.

Autonomous behaviors evaluated in this year's challenge include...



Navigation



Detection



Object
Delivery



Object
Avoidance



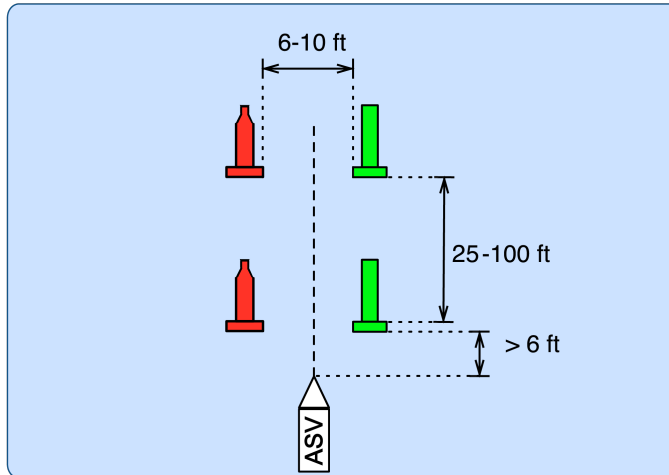
Station
Keeping



Two-step
Behaviors

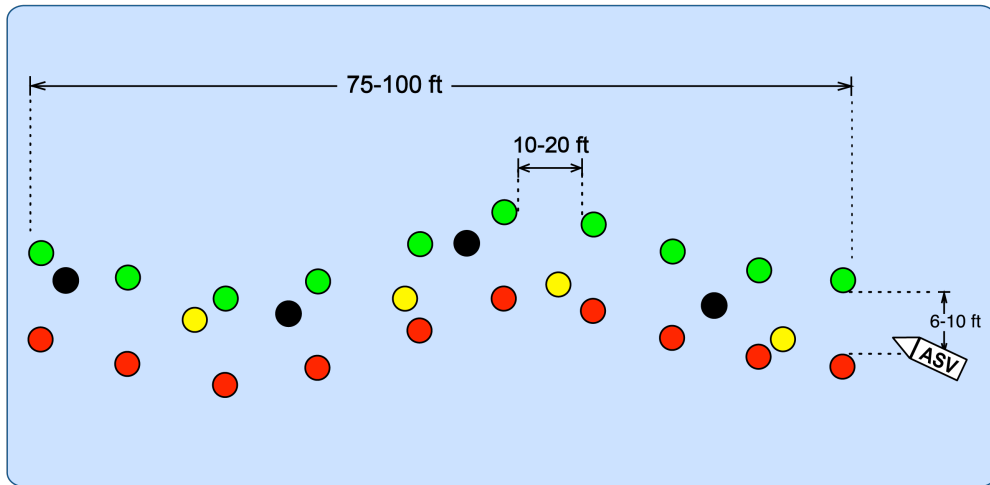
Task 1: Navigation Channel

- Mandatory before attempting other tasks.
- ASV passes through two sets of gates.
 - Gate: pair of red and green buoys
 - ASV starts autonomous navigation at a minimum of 6 ft. before the set of gates.



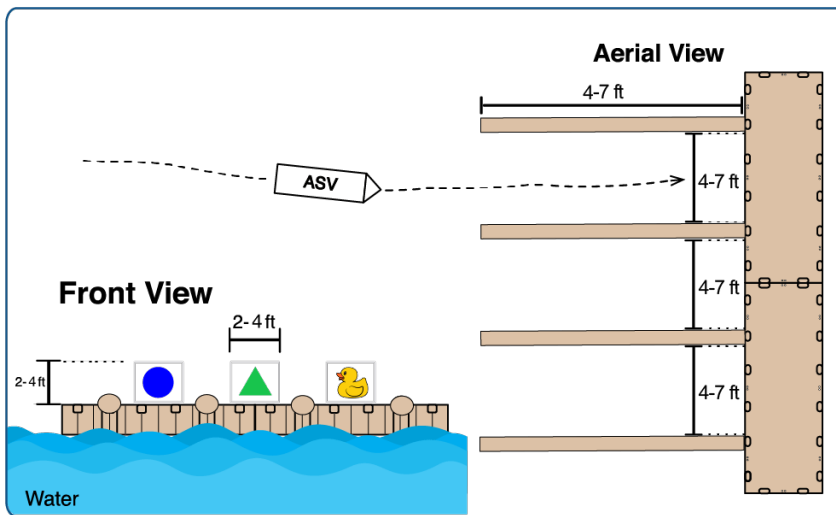
Task 2: Follow the Path

- ASV passes through a pathway between multiple sets of gates and avoids intermittent yellow and black buoys.
 - Gate: pair of red and green buoys
 - Count and report duck sightings (yellow buoys)



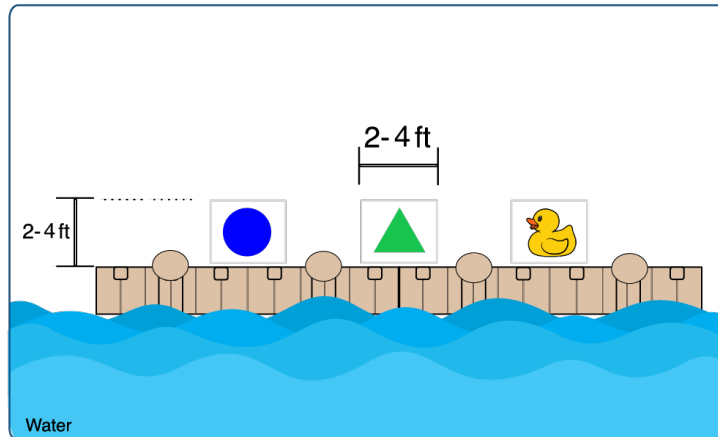
Task 3: Docking

- ASV detects and enters the docking bay corresponding to the color of the day.
- Docking bays could have banners with any of the following:
 - Shapes – circle, triangle, square, plus sign
 - Colors – blue, green, red
 - One docking bay will have an image of a duck, also used for Task 4.



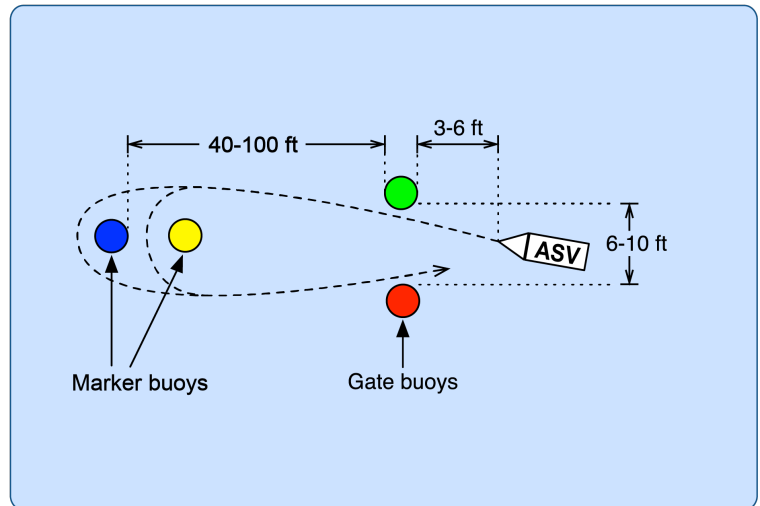
Task 4: Duck Wash

- ASV detects an image of a duck in one of the docking bays (located on docking task).
 - The duck banner could be in any position on the docking bays, differing on each course.
- ASV delivers water on target.
 - Scoring is being discussed to determine how long the water must be sprayed on target to earn maximum points.



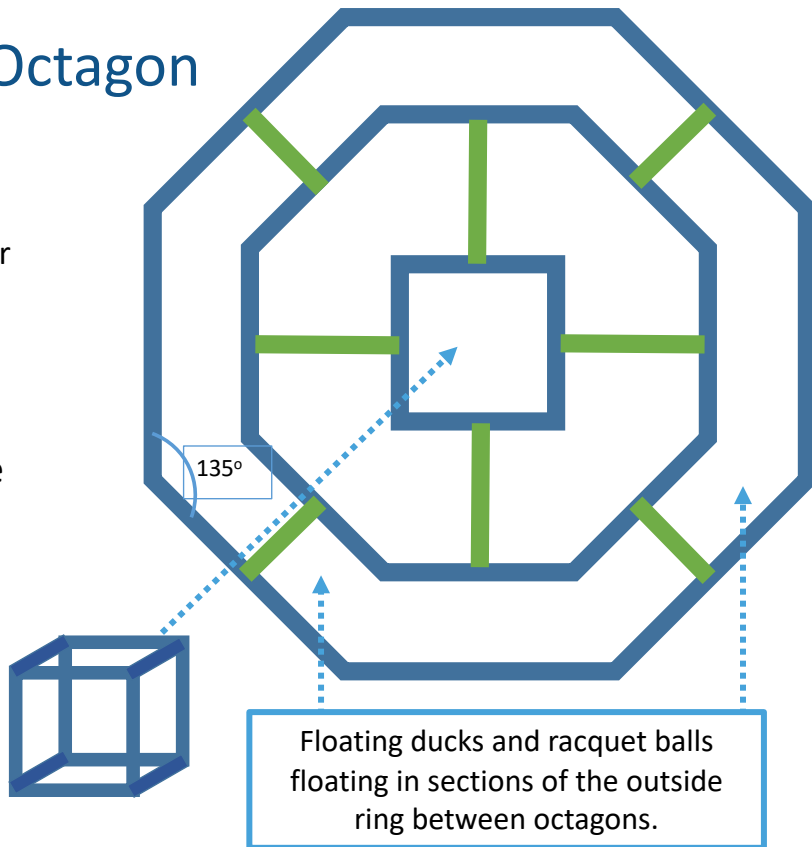
Task 5: Speed Challenge

- ASV enters the gate buoys, maneuvers around the marker buoy, and exits through the same gate buoys, as quickly as possible.
 - The blue buoy may be positioned on either side of the yellow buoy.
- The timer starts when the bow (front) crosses the gate buoys and stops when the bow (front) crosses the gate buoys.
 - Gate buoys: 6-10 ft apart
 - Marker buoys: 40-100 ft from gate buoys



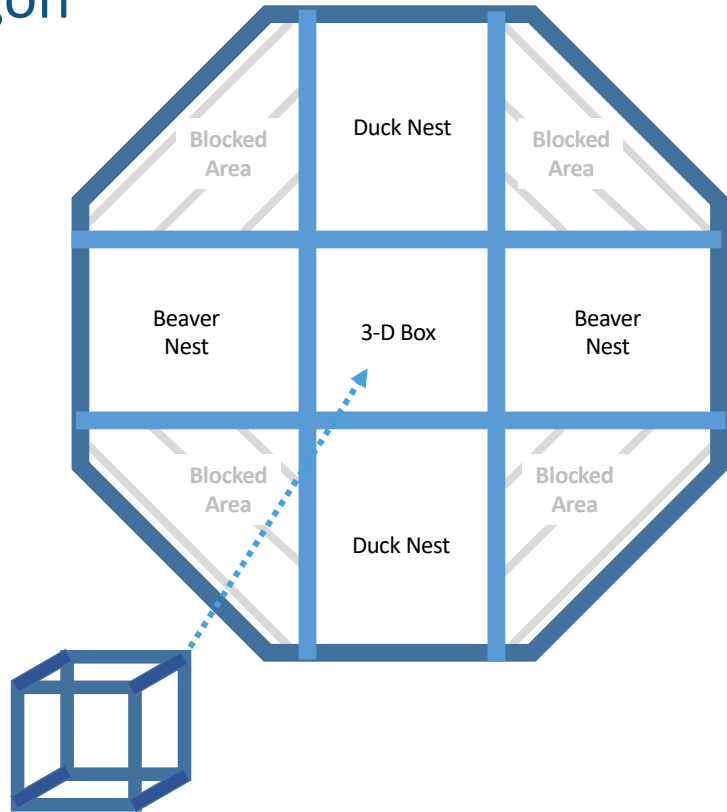
Task 6: Collection Octagon

- ASV detects collection octagon and collects items.
 - Items include: floating rubber ducks and red racquetballs.
 - ASV then delivers the collected items to the Delivery Octagon (Task 7).
- Collection area floats on the surface of the water and is approximately 6 feet in diameter.
- 3-dimensional cube in the center of the octagon aids the ASV to detect the task.
 - Panels could be solid colors, shapes, images, etc.



Task 7: Delivery Octagon

- ASV detects delivery octagon.
- ASV delivers collected items from Task 5.
 - More points if items are delivered to the correct "nests".
 - Some points for delivering items inside the octagon.
- Collection area floats on the surface of the water and is less than 6 feet in diameter.
- 3-dimensional cube in the center of the octagon aids the ASV to detect the task and identify the nests.
 - Panels could be solid colors, shapes, images of ducks and beavers, etc.

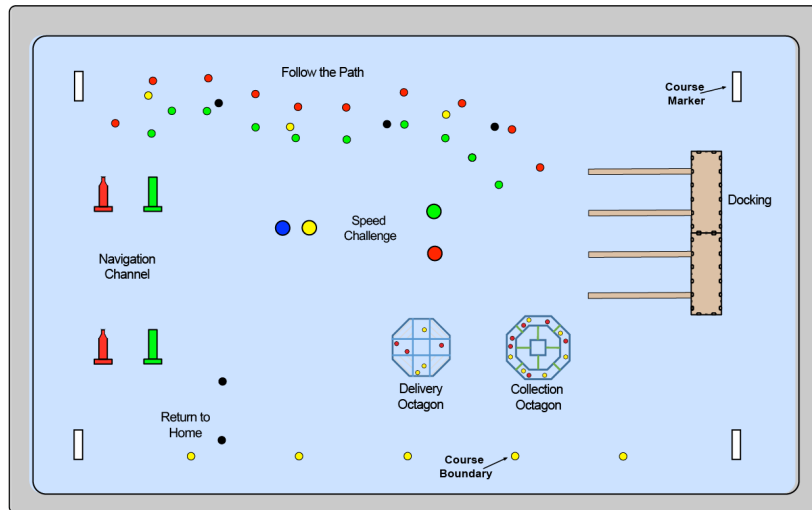




Time Bonus: "The First Duck Gets the Worm"
Multiplier applied to overall points earned, based on the number of seconds remaining on the timeslot clock.

Task 8: Return to Home

- ASV returns to start of course in autonomous mode, maneuvering through a pair of black buoys positioned near the start of the course.
- Some points will be earned for completing the run through the pair of black buoys. More points will be received based on the tasks attempted/completed in the run.



DEC 2023

Pre-
Competition
Submission
Deadlines

JAN 2024

Pre-
Competition
Evaluation
(Online
Judges)

Overall Schedule

FEB 5 MON	FEB 6 TUE	FEB 7 WED	FEB 8 THU	FEB 9 FRI	FEB 10 SAT	FEB 11 SUN
	8:00 am – 5:30 pm Practice & Qualifications					
1:30 pm Team Orientation (mandatory)		9:00 am – 5:00 pm Design Presentations / System Assessment			Time TBD Finals Rounds	
2:30 pm Safety Inspections	2:00 pm Judges' Training					
5:30 pm – 6:00 pm Daily Team Meeting (mandatory)						
						7:30 pm Awards
10:00 pm – 2:00 am Overnight Pool Testing (@ Hotel)						

Stay Updated

ALL THINGS ROBOBOAT

For all the latest information and updates all week, visit the RoboBoat website!



roboboat.org

DISCORD

Stay connected and updated with the RoboBoat Discord. Scan the QR code below to get started!



JOIN TODAY!

- Scan the QR Code
- Select the RoboBoat role
- Turn on notifications!



robonation.org/discord



robonation



seaperch



seaglide



gosense



roboboat



robosub



robotx



RoboNation is a 501c3 nonprofit organization whose mission is to provide a pathway of hands-on educational experiences that empower students to find innovative solutions to global challenges. Working together with the industry, research and educators, we have grown to include over nine student competitions and programs and engage more than 250,000 students per year.

For more information contact autonomy@robonation.org