

RoboSail Workshop 5

Objectives Students will:

- Fully implement Autonomous sailing with manual cues.
- Review the Regatta challenges and plan your strategy for getting your rating.

Part I Learn/discuss how RC Transmitter can be used in Automatic Sail mode (30 min)

1. Discuss current sail and rudder control from AutoRudderPOSwithSwitch.ino
 - a. In manual mode, only the rudder is controlled by the user, the sail is always autonomous
 - b. In autonomous mode the sail and rudder are fully controlled by the Arduino code, and the boat will sail to a POS (point of sail) specified in the code.
 - c. The sail control lever on RC Transmitter is used for the manual/autonomous switch. In autonomous mode, the rudder control lever is available for signaling. It is spring loaded to center. How can it be used for changing the POS?

Part II Develop algorithm and code to change Point of Sail by using cues from RC Transmitter (120 min)

1. Discuss/develop algorithm for code (full Autonomous with Manual Cues)
 - a. Discuss how you are using the RC Transmitter to initiate a maneuver
 - i. Use “Rudder Left” (< 1200) and “Rudder Right” (> 1800) as signals that can tell the boat to change direction by some amount
 - ii. Check that the Rudder command has gone back to “0” center before starting another maneuver. (check that 1400 < Rudder < 1600)
2. Coding exercise 4: Develop code for sending cues to change direction
 - a. Use a variable to hold the increment, remember to set it back to 0 after adding it in
 - b. Create new code called AutoRudderPOSwithSwitchCue.ino using AutoRudderPOSwithSwitch.ino code from the last exercise
 - c. Debug/Test/Revise in classroom then on the water
3. Try the code and observe/record the timing
 - a. Tacking, gybing
 - b. sailing around a buoy
 - c. getting out of irons
 - d. Can you program in timing such that it will do a maneuver after a certain amount of time has passed?
4. Share results and debrief with other groups

Part II Plan for Regatta (30 min)

1. Present Regatta – a series of tasks that your boat will demonstrate to earn ratings
2. Discuss with your group and plan your work
 - a. Create different programs for different tasks.
 - b. Get more points for autonomous sailing, but can use manual rudder if necessary
3. Start Coding for regatta tasks or testing on the water