



RoboParade

Fully autonomous robot floats follow an indoor parade route

V 1.5 – Final Version for 2023 Season and World Championship

This file can be found under the **Get Involved / RoboParade** page on the website
Each country may clarify/adapt/change rules for each country's qualifying competitions

Coaches are responsible for communicating rules updates to participants

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1. RoboParade Overview

Learning Objectives

- STEM learning with Arts and Design
- Artistic creativity
- Autonomous navigation
- Basic computer programming logic
- Line following
- Object detection
- Autonomous stopping and restarting
- Adjusting to environmental conditions
- Problem solving
- Teamwork skills

Synopsis

- An Open Category competition. No qualifying competitions for this challenge
- Hosted at the Robofest World Championship
- Local events may also host RoboParade (Teams must re-register for World Championship event)
- Fully autonomous robot floats constructed and programmed by student participants
- Programmed to follow an indoor parade route while detecting other robots in front of them. Robot must stop and start without human help
- A great STEAM (Science, Technology, Engineering, Arts, and Math) learning opportunity for students
- An ideal event for beginners in autonomous robotics

2. RoboParade Theme

Robofest World Championship 2023 event theme:

Animation

Animation refers to animated (still figures manipulated to appear as moving) cartoons, movies and videos. Teams can use themes from popular culture (Disney, DC, Marvel, Anime, Pokémon, Sponge Bob, etc.) or create their own.

Other local hosts may choose their own theme

3. RoboParade Age Division and Team Size

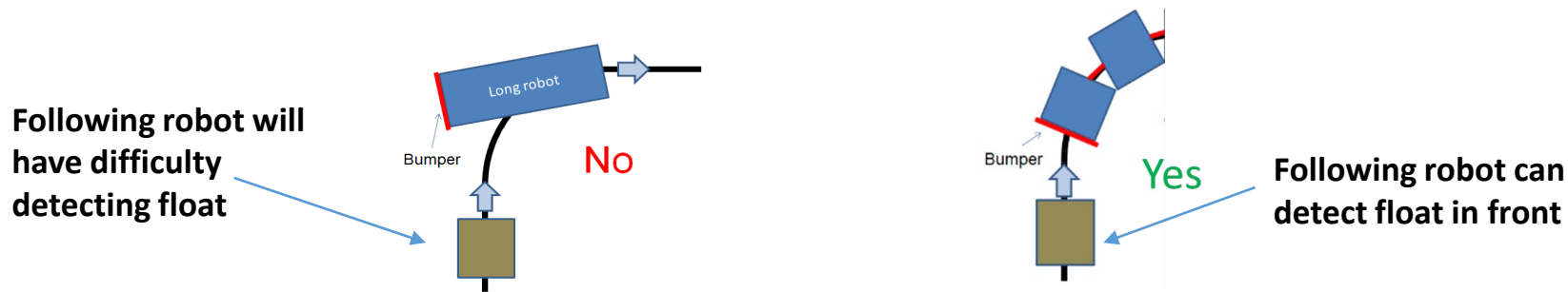
- One Age Division: Grades 4~8
- Team Size: Maximum five (5) members
- A team can enter only one robot float
- Team Registration Fee: \$75 at the Robofest World Championship (Registration fee at local events may be different)
- Related important document: Robofest 2023 [General Rules](#) on the robofest.net website
- Each team member must bring the signed [Robofest Consent and Release Form](#) on the day of the event, if not completed on-line

4. Robot Requirements (1/2)

- Number of robot controllers, sensors (any type), or motors: unlimited
- Each robot is required to carry a small flag with a number, which will be given once the robot passes the Test Parade
- Each robot may have its own sponsor logos
- Wireless interaction between the robot and team players using sound, ultrasonic, vision, or light sensors is encouraged
- Robot data display
 - Examples: current speed, distance (traveled in cm, for example), and elapsed time
 - Robots that do not display data can still participate, but it will be a factor in judging
See Judging Rubric <http://www.robofest.net/images/1920/RoboParade2022Rubric.pdf>
- No overall height or weight limitations
- Maximum width 35cm (13.78 in)

4. Robot Requirements (2/2)

- The rear of the float must have a flat bumper *at least 10cm (3.9") tall and 28 cm (11") wide* and be 2.54cm (1 inch) off the ground so that the robot behind is able to sense your robot using its distance sensors
- Maximum overall length is 60cm. If longer than 35cm (13.78 in), it must have train-like flexible bending structures at curves as shown:

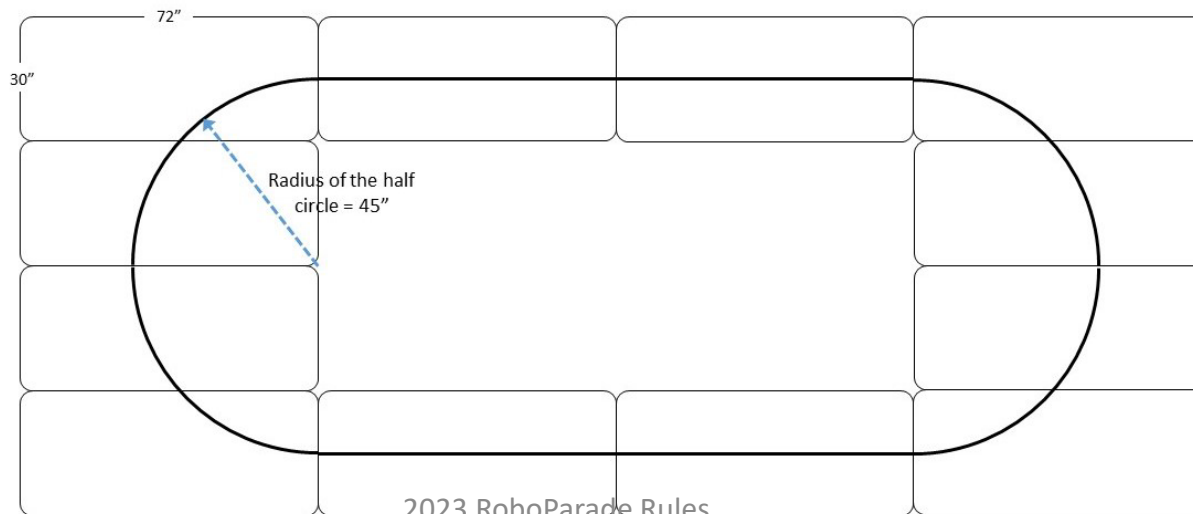


- Robot must have a reliable program to follow a black line on a bright surface
- Robot must be able to follow both clockwise or counter-clockwise parade routes
- Robot must have the ability to detect a vehicle in front of it without touching it and stop. Robot then must automatically restart when the vehicle in front has cleared
- Robot speed must be between 9 cm/sec and 18 cm/sec

5. RoboParade Route Tables (1/3)

- Parade route is made from plastic folding tables 30in x 72in. (actual size is about 75cm x 182 cm)
- Recommended brand is “Lifetime” <https://www.lifetime.com/lifetime-2901g-6-foot-folding-table-commercial>
- Tables can be placed on the floor using the table legs, or on a crate with the table legs folded in. Alternatively, a table covered with white paper or white vinyl table cover can be used
- Standard black electrical tape can be used to make a closed rectangular shape with 4 rounded corners

example of a possible official parade route configuration



5. RoboParade Route Tables (2/3)

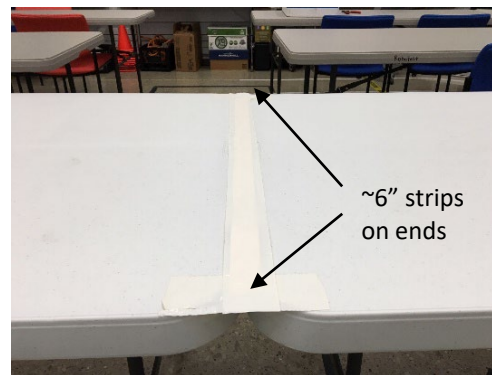
- A thin strip of poster paper is used to cover the joints formed by the table edges
- 2in wide tape (colored duct tape, masking tape, or similar) can be used to connect and hold tables together. The tape should have a color that matches the table
- Standard black electrical tape is then applied to the tables and over the joints



a) table joint with gap



b) with poster paper filler (~1"wide)



c) with 2" tape



d) Finished connections with 2" tape and black line from electrical tape

5. RoboParade Route Tables (3/3)

- Parade route at World Championship may have retaining walls
- Walls made of 2x2 wood attached to tables with dual lock tape

2019 World
Championship
course with
2x2 retaining walls



6. RoboParade Competition Procedure.

- Each team must pass a **Test Parade** to ensure that all robot vehicles meet the specifications and functional requirements
 - World Championship Qualifying will be available the day before the competition date
- Early qualification is encouraged. This gives a team early feedback on whether they are ready or what they need to improve
- The parade route will be made available for practice before the qualification period begins
- No limit to the number of qualifying attempts
- Upon passing the Test Parade, the float ID (flag) will be given which allows the robot to participate in the official parade
- Teams that do not fully meet requirements may still be given a flag and allowed to compete, though ability to meet requirements will be considered in the judges' evaluations

7.1 RoboParade Test Parade Checklist

Test Item	Details	Pass / No Pass	Note
Line following	<i>Clockwise, counter-clockwise</i>		
Object Detection	<i>Wait and restart</i>		
Speed limit	<i>9cm/sec ~ 18cm/sec</i>		
Rear bumper	<ul style="list-style-type: none"> • <i>at least 10cm tall and 28 cm wide</i> • <i>2.54cm off the ground</i> 		
Width	<i>Maximum 35cm</i>		
Length	<i>Maximum 60cm</i>		<i>For a float longer than 35cm it must have multiple units connected</i>

7.2 RoboParade Judging Rubric

(*) Judging Score

5: Strongly Agree	excellent, outstanding, advanced, exemplary, or amazing
4: Agree	good, accomplished, or proficient
3: Neutral	average, intermediate level, or acceptable
2: Somewhat Disagree	attempted but needs work
1: Disagree	little attempted or needs lots of help

<https://www.robofest.net/images/2223/RoboParade2023Rubric.pdf>

1 ~ 5

Judging Category	Sub Categories	Weight	Score*
1. Artistic creativity	Robot float is unique, artistically appealing, and aligned with theme.	15%	
2. Technical creativity	Students applied unique technically creative and innovative elements to the robotics project.	15%	
3. Interactions	There are elements of wireless interaction between the robot and the team players using sensors or other communication technologies.	10%	
4. Robot design and performance	Robot mechanical design is creative, user-friendly, and sturdy. Robot reliably and successfully negotiates the official parade route. No human touch is required. Robot meets all qualifying requirements.	20%	
5. Teamwork	Teamwork and team spirit are evident. <i>Note: If the team only has one member, the score should be 1.</i>	10%	
6. Robot display	Useful data (speed, distance, etc) is displayed in clear manner.	10%	
	Students are able to demonstrate and explain display and data.	10%	
7. Team independence	I believe the project was mostly designed, developed, and programmed by the students, not by adult coaches, parents, or mentors.	10%	

100%

8. RoboParade Judging

- Each team member who participates in the official RoboParade will receive a medal
- A panel of Judges will score the team's performance using the RoboParade Judging Rubric by observing teams all day and especially official parade times
- Judges will interview teams
- Winner trophies will be awarded based on the overall scores
- Special award trophies may be given to recognize an extraordinary aspect of a parade float