



LAWRENCE TECHNOLOGICAL UNIVERSITY ROBOFEST® Exhibition

Intelligent and Interactive Robotics Science Fair

V 3.0 – Final Version for 2024 Season

This file can be found on the **Exhibition** page on the website
Coaches are responsible for communicating rules updates to participants

www.robofest.net

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21000 West 10 Mile Road, Southfield, MI 48075, USA

1. Exhibition Overview

Learning Objectives

- Applications of Science, Technology, Engineering, Math, and Artificial Intelligence (AI)
- Creativity and problem solving
- Technical communication skills
- Developing autonomous algorithms
- Computer programming logic
- Sensor implementation
- Adjusting to environmental conditions
- Teamwork

Synopsis

- **Qualifier Category:** Teams compete at local or online qualifiers, or through video submission, to advance the Robofest World Championship
- Robofest Exhibition is a great way for students to show off their imagination, innovation and creativity
- Each team has complete freedom to create interactive and intelligent robotics projects such as robots for scientific experiments and robots for practical applications

2. Age Divisions and Team Size

- Age Divisions:
 - Junior Division (Grades 5-8)
 - Senior Division (Grades 9-12)
- Team Size: Maximum five (5) members
- Team Registration Fee:
 - \$75 - Local or Video submission Qualifier (International events may be different)
 - \$75 - Robofest World Championship (if team advances)
- Related important document - [2024 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 online

3. Project Requirements/Limitations (1/3)

- At least one week prior to competition day, teams are required to provide:
 - Brief written project description
 - Preview Video link uploaded to the Robofest registration system
 - Source code for judge review. Coach will receive instructions as to where to send file.
- Teams must bring all the necessary materials for their Exhibition presentation
- Any material that is safe for humans can be used
- Robot-to-robot as well as human-to-robot interactions are strongly encouraged
- Wireless program controlled remotes are allowed. For example, a human controlled EV3 controller can control other EV3 robots if the program of the remote controller is written by students
- Sensors must be employed to assure the robot is interacting with its environment instead of just dead-reckoning

3. Project Requirements/Limitations (2/3)

- The demonstration space for each team is limited to a maximum of 64 square ft, including a 6ft or 8ft table that is provided by the host. Teams may choose to demonstrate robots/devices on the floor. Exceeding maximum space allowed may result in deduction of points
- Projects which have been entered in a previous competition category of any kind can be entered, but team must:
 - Add new features and/or significantly improve or change one or more features
 - Describe the addition/changes in the project description text area of the online team registration page
 - Inform Judges during the official presentation that their project is a “continued” form of a previous project

3. Project Requirements/Limitations (3/3)

- Preview Video requirements:
 - Approximately 4 minutes, max 5 minutes
 - Includes the Team ID, Team Name and team member introduction
 - Preview Video should be submitted one week prior to the competition
 - Preview Video may be the same or differ from the live demonstration
 - Editing is allowed
- Teams advancing to the Robofest World Championship Finals must resubmit project information (updates on the Robofest registration system, preview video, and the source code) one week prior to competition for judge review

4. Project Recommendations

- Points will be given for the use of advanced technologies, such as AI (artificial intelligence, machine learning) or vision. See Section 6b of judging rubric
- It is requested that teams use poster boards or other visuals to describe their projects
- In addition to submitting the required 4 minute Preview Video, Exhibition teams may set up a team website and/or publish a video clip on a video sharing site such as YouTube
 - Judges will use info to preview the team project prior to the competition day
 - Teams should plan to bring a laptop to show their video and/or display their website during the competition
- Visit www.robofest.net and click on the Prior Years link to view Exhibition projects from previous years

5. Project Presentation

- Teams must present their Exhibition project to the group of Judges with a formal presentation at a time specified by the Site Host
- Teams will have a maximum of 4 minutes to explain and demonstrate their project to the Judges
- Teams are responsible for keeping track of their 4-minute time limit
- Exceeding time limit may result in deduction of points
 - Judges will tell teams to wrap up once the 4 minute mark has been reached
 - Presentations that go beyond 4:30 will be penalized 1 point for every 30 seconds beyond 4 minutes
- Judges will then conduct a 2-minute Question/Answer session
- Teams may also present & demonstrate their project to spectators throughout the event

6. Exhibition Judging

- The judges will use the rubric that is posted on the “Exhibition” page at robofest.net
- In addition to the formal presentation and Q/A session, Judges will visit the team tables individually to ask additional questions, evaluate robots, and inspect program code at any time within the Official Judging time blocks, as noted in the program
- “Secret Judges” may visit teams throughout the day to ask questions, check displays and observe interactions with spectators. These judges will not identify their roles
- Age-appropriate math and science applications will be judged
 - Advanced level skills are fine to use, however, they may not necessarily result in the highest scores in the STEAM learning category on the rubric

7. Code Submission Instructions

- Site host will email the code uploading instructions to the Coach 10 days prior to the competition
- Exhibition teams must submit their source code one week prior to the competition
- Site Host will provide team's code documents to Judges to be reviewed prior to the event
- Judges will assess how well the code is designed, structured and commented
- Code Submission Guidelines:
 - Pdf format (print programs or images can be pasted into Google Slides or PowerPoint, then saved as pdf)
 - Arrange code to help make it easy to understand
 - If needed, add comments to help explain
 - Highlight aspects of code that are important
 - 1 file per team
 - Include team number and team name in file name (ex: 2913-4_Xteam.pdf)

8. Judging Rubric (1/2)

<https://www.robofest.net/images/2324/Exhibition24Rubric.pdf>

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

1 ~ 5

Judging Category	Sub Categories	Weight	Score
1. STEAM learning	This project truly demonstrates applications of science, technology, engineering, math, and artificial intelligence (AI).	8%	
	Students have an age appropriate understanding of the science, technology, engineering math, and artificial intelligence (AI) concepts they applied.	8%	
2. Project idea and originality	The project idea is very original and showed impressive creative thinking and problem-solving skills.	10%	
3. Project demo performance (robot)	The official live robot demo is free from problems and very impressive.	10%	
4. Project presentation	Project presentation is clear, well organized, and delivered effectively within the allowed time.	8%	
	Information on the team poster, brochure and signage is clear, well designed, and able to be understood even by robotic novices. Project is within allowed size parameters (max 64 ft ² or 5.95 m ² including table).	4%	
5. Solution design	The solution design is creative, effective, user-friendly, and sturdy.	10%	

8. Judging Rubric (2/2)

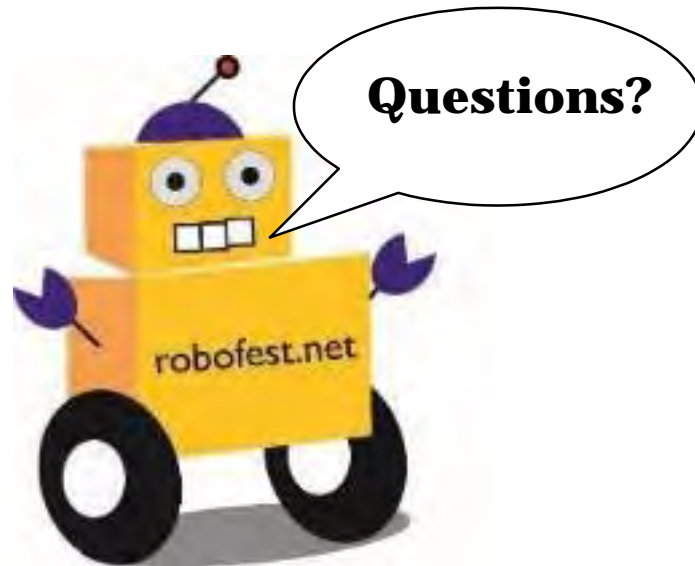
6. Project complexity	The project is complex with multiple features/functions, sensors, and components.	7%	
	Project uses advanced technologies such as AI (artificial intelligence, machine learning) or vision.	3%	
7. Practicality	The project shows potential as a useful and practical application of robotics technology.	8%	
8. Programming	Students able to explain their programming code during live presentation.	4%	
	Programs are well designed, structured, and commented (code document must be submitted).	10%	
9. Team independence	Based on my observations and interaction with the team, I believe the project was mostly designed, developed, and programmed by students, not by adult coaches, parents, or mentors. The students were able to clearly and confidently explain each part of their project.	5%	
10. Preview Video	The video gives a clear explanation of features of the project, includes the Team ID, Team Name and Team member introduction (min 4 minutes/max 5 minutes). Video may be edited	5%	

updated 1/13/2024

9. Exhibition Video Submission Option

- Teams that cannot attend an in-person qualifier may compete via Video Submission (US and International)
- If a team competes via video submission, the submitted video takes the place of the live presentation and the preview video
- Video submission has additional requirements over the preview video guidelines, as outlined in the section 6 of the Robofest General Rules: ([LINK](#))

Little Robots, Big Missions



Exhibition Committee Members

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Send questions to: robofest@LTU.edu