



LAWRENCE TECHNOLOGICAL UNIVERSITY
ROBOFEST

RoboArts 1010 1010

Intelligent and Interactive Robots in Visual and Performing Arts

V 2.0 – Final Version for 2024 Season

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

www.robofest.net

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1. RoboArts Overview

Learning Objectives:

- Developing autonomous algorithms
- Creative use of robotics in an artistic way
- Computer programming logic
- Sensor implementation
- Adjusting to environmental conditions
- Problem solving
- Technical communication skills

Synopsis:

- **An Open Category competition**, which will take place at the World Robofest Championship
- Local events may also host RoboArts (Teams must re-register for World Championship event)
- A unique STEAM (Science, Technology, Engineering, Arts, and Mathematics) competition with intelligent and interactive robots in the visual and performing arts categories
- Robotic visual art includes drawing/painting, kinetic arts, and sculptures. Robotic performing arts include dance, music, and skits

2. Age Divisions and Team Size

- Age Divisions:
 - Junior Division (Grades 5-8)
 - Senior Division (Grades 9-12)
- Team Size: Maximum five (5) members
 - Recommend 2 or 3 students per robot controller used
- Team Registration Fee: \$75 at the World Championship (Registration fee at local events may be different)
- 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 RoboArts 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 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, maximum of 5 minutes
 - Includes the Team ID, Team Name, and Team member introduction
 - Video should be submitted one week prior to the competition
 - Video may be the same or have differences from live demonstration
 - Editing is allowed
- International teams advancing to the Robofest World Championship Finals must submit 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 5b of judging rubric.
- It is requested that teams use poster boards or other signage to describe their projects.
- In addition to submitting the required 4 minute Preview Video, RoboArts teams may set up a team website and/or publish a video clip on a video sharing site such as YouTube
 - Judges will use them to preview the team projects 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 robofest.net and click on the Prior Years link to view RoboArts (formerly known as GRAF) projects from previous years

5. Project Presentation

- Teams must present their RoboArts 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 1pt 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. RoboArts Judging

- The Judges will use the rubric posted on the “RoboArts” 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
- RoboArts 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/RoboArts24Rubric.pdf>

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

1 ~ 5

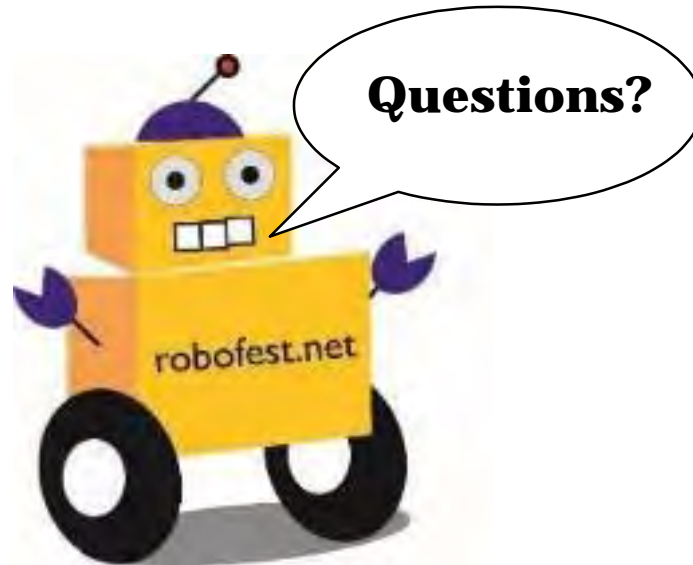
Judging Category	Sub Categories	Weight	Score
1. Artistic concepts and project creativity	Students applied relevant art concepts and unique artistic elements to the robotic project.	20%	
2. Interactions	The robot(s) interacted with other robots, humans, and/or the environment.	10%	
3. Project demo performance (robot)	The official live robot demonstration is free from problems and artistically impressive.	11%	
4. Project presentation (humans)	Project presentation was clear, well organized, and delivered effectively.	7%	
	The team used posters, and brochures to promote their project. Project is within allowed size parameters (max 64 ft ² or 5.95 m ² including table).	4%	
5. STEAM learning	This project applied age-appropriate concepts of math, technology, science and that the students could easily and effectively explain.	7%	
	Project uses advanced technologies such as AI (artificial intelligence, machine learning) or vision.	3%	

8. Judging Rubric (2/2)

6. Solution design	The solution design was creative, user-friendly, and sturdy. (If the majority of the project was made by others or purchased, give a score of 1).	8%	
	The project is complex with multiple features/functions and components.	6%	
7. Programming	Students are able to explain their programming code during live presentation.	4%	
	Programs are well designed, structured, and commented (code document must be submitted).	10%	
8. 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%	
9. Preview Video	The video gives a clear explanation of features of the project, including the Team ID, Team Name and Team member introduction (min 4 minutes/max 5 minutes). Video may be edited.	5%	

updated 1/13/2024

Little Robots, Big Missions



RoboArts Committee Members

Pam Sparks *
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Send questions to: robofest@LTU.edu