Intelligent and Interactive Robots in Visual and Performing Arts

V 1.0 – Final Version for 2021

This file can be found under the **Get Involved > RoboArts** Page on the website
Coaches are responsible for communicating rules updates to contestants

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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

- A unique STEaM (Science, Technology, Engineering, Arts, and Mathematics) competition with intelligent and interactive robots in the visual and performing arts categories

- Robotic visual arts includes drawing/painting, kinetic arts, and sculptures. Robotic performing arts include dance, music, and skits

2. RoboArts 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: (may be different for international sites)
  - $20 Online or Video Qualifier
  - $75 in-person

- Related important document - Robofest 2021 General Rules

- Each team member, as well as the coach, must bring the signed Robofest Consent and Release Form on the day of the event, if not completed online

3. Project Requirements/Limitations (1/2)

- Teams are required to provide a brief written project description, a video link (uploaded to the Robofest registration system) and the source code (using a google form) one week prior to competition for judge review. Code inspector(s) may recommend points for programming.

- 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

- Team will be provided by the host a 6ft or 8ft long table on which to display/demonstrate the robots

3. Project Requirements/Limitations (2/2)

- Teams may choose to demonstrate robots on the floor. However, the space for each team is limited to a maximum of 64 square feet including the table. (Exceeding maximum space allowed may result in deduction of points)
- Teams must bring all the necessary materials for their RoboArts presentation
- 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 form
  - Inform Judges during the official presentation that their project is a "continued" form of a previous project

RoboArts Rules 2021
02/06/21

4. 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 RoboArts 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

- If in-person, teams may also present & demonstrate their project to spectators throughout the event

5. RoboArts Judging

- The Judges will use the rubric that is posted on the "RoboArts" page at robofest.net

- In addition to the formal presentation, 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 STEM learning category on the rubric

6. Project Recommendations

- It is requested that teams use poster boards or other signage to describe their projects

- In addition to submitting the required 4 minute video, it is highly recommended that each RoboArts team 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

RoboArts Rules 2021

7. Code Submission Instructions

- To help judge Exhibition, RoboMed, and RoboArts, teams must submit their source code 1 week prior to the competition
- Judges will assess how well the code is designed, structured and commented
- 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

RoboArts

Robofest RoboArts Judging Rubric

Division: _____Jr. ____ Sr. Team Name: _____ Team ID: _____

Judge Name: _____

Brief project description:

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

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Judging Category	Sub Categories	Weight	Score
1. STEM learning	This project truly demonstrates applications of science, engineering, and math.	8%	
	Students have an age appropriate understanding of the science, engineering and math 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 during the webinar is free from problems and very impressive.	10%	

8. Judging Rubric

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%	
6. Project complexity	The project is complex with multiple features/functions, sensors, and components.	8%	
7. Practicality	The project shows potential as a useful and practical application of robotics technology.	8%	
8. 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 to Robofest[*]).	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. 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).	7%	

updated 02-06-2021

9. Online Format Team Setup

- Each team must be ready to demo & run robots alone at **one** location
- Each team must have a means for video conferencing (camera & microphone). We will assign **one** login for each Exhibition Style team location
- Multiple teams at one location are not recommended. We may have social distancing issues and audio echo problem if multiple speakers are used
- Coach must print team sign and print and complete the pre-event checklist in advance of event day (See sample on next slide)
- Teams will present in the order determined by the site host

10. Online Pre-Event Checklist Example

RoboArts
Coach Pre-Event Checklist

Coach is required to PRINT THIS CHECKLIST and check off each item before logging in to the Platform on event day. During Online Event Check-in, be prepared to show this sheet to Site Host.

Prior to Event: (check each item with a heavy mark so it is visible on camera):
☐ Upload Presentation Video link to Team Registration Page
☐ Send Code document to Site Host through Google Forms
☐ Register for Online Platform (i.e. Zoom) with the Registration Link sent by Site Host
☐ Prepare Platform device (Laptop, Tablet or Phone)
  ❏ stable internet connection
  ❏ battery fully charged
  ❏ camera accessible
  ❏ Set up for initial presentation and can be moved to watch presentation and demonstration
  ❏ microphone/speakers (test volume, mute/unmute)
☐ Print Team Sign (File Operations on Coach Home Page) and have it ready to show
☐ Confirm Consent Form (online or hard copy) completed for each participant
☐ Attend the Pre-Meeting if scheduled

Event Day - Prior to Zoom Webinar Check-in:
☐ Inspect project for any illegal Materials: Any material that is safe for humans can be used
☐ Confirm that project meets space requirements (max 64 sq ft including table)
☐ Assemble Team to prepare for Event Check-in

I _____ verify that I have completed each item on this checklist