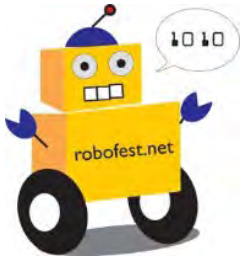


23rd LAWRENCE TECHNOLOGICAL UNIVERSITY ROBOFEST 2022

Kickoff II Meeting

January 15, 2022, 10:00 am EST

This file can be found under the **Get Involved→2022 Main** Page on the website

www.robofest.net robofest@ltu.edu 248-204-3568

Room J233 Taubman Complex, LTU
21000 West 10 Mile Road, Southfield, MI 48075, USA

ROBOFEST Lawrence Technological University 1010

Welcome to Robofest 2022

Little robots, Big Missions

Robofest Staff

Staff

- Dr. Chris Cartwright, Robofest Director, Associate Professor of Mathematics
- Elmer Santos, Assistant Director
- Shannan Palonis, Coordinator
- Pam Sparks, Coordinator
- Teri Dubois, Coordinator
- Steven Kryskala, Web Developer
- Marilyn Wiseman, MCS Department
- David Carbery, Technical Advisor
- Dr. CJ Chung, Prof. of Computer Science, Founder, Advisory Board Chair (Volunteer)

Student Assistants

- Anthony Shevenock
- Robert Newberry
- Scottie Rapp
- Harika Vegalabudi

Meeting Agenda

I. *Overview of Robofest*

II. *2022 Competition Season Schedule*

III. *Qualifier Categories*

IV. *Open Competition Categories*

V. *2022 Formats and Registration Fee Schedules*

VI. *How to Advance to Robofest Online World Championship*

VII. *Q & A*

VIII. *2022 Game "OceanBots" Rules*

Robofest® Is:

- Hosted by Lawrence Technological University in Southfield, MI
- An annual international robotics competition designed to promote and support Computer Science, Arts, and STEM (Science, Technology, Engineering, and Math) learning through autonomous robotics

Robofest Mission Statement

Robofest's mission is to:

- Generate excitement and interest among young people for Science, Technology, Engineering, and Mathematics (STEM), Arts, and Computer Science
- Develop essential skills such as teamwork, leadership, creativity, communication and problem solving
- Prepare students to excel in higher education and technological careers

Robofest Features

- 100% Autonomous – sensors required
- Challenging
  - dynamic playing fields
  - unknown factors
  - **no** direct adult help allowed
- Any robotics kit / system allowed
- Affordable (reuse old kits; Registration fee: $75 per team per event)
- Pre and Post Assessments (on-line)
- Qualifying Competitions & World Championship
- Age Divisions for most categories:
  - Jr. Division: 5^{th} – 8^{th} (in spring 2022)
  - Sr. Division: 9^{th} – 12^{th} (in spring 2022)
- Variety of competition categories for more opportunities in STEaM learning

Robofest Team Pledge

As a Robofest team member, I understand that the focus of Robofest is about learning through competition.

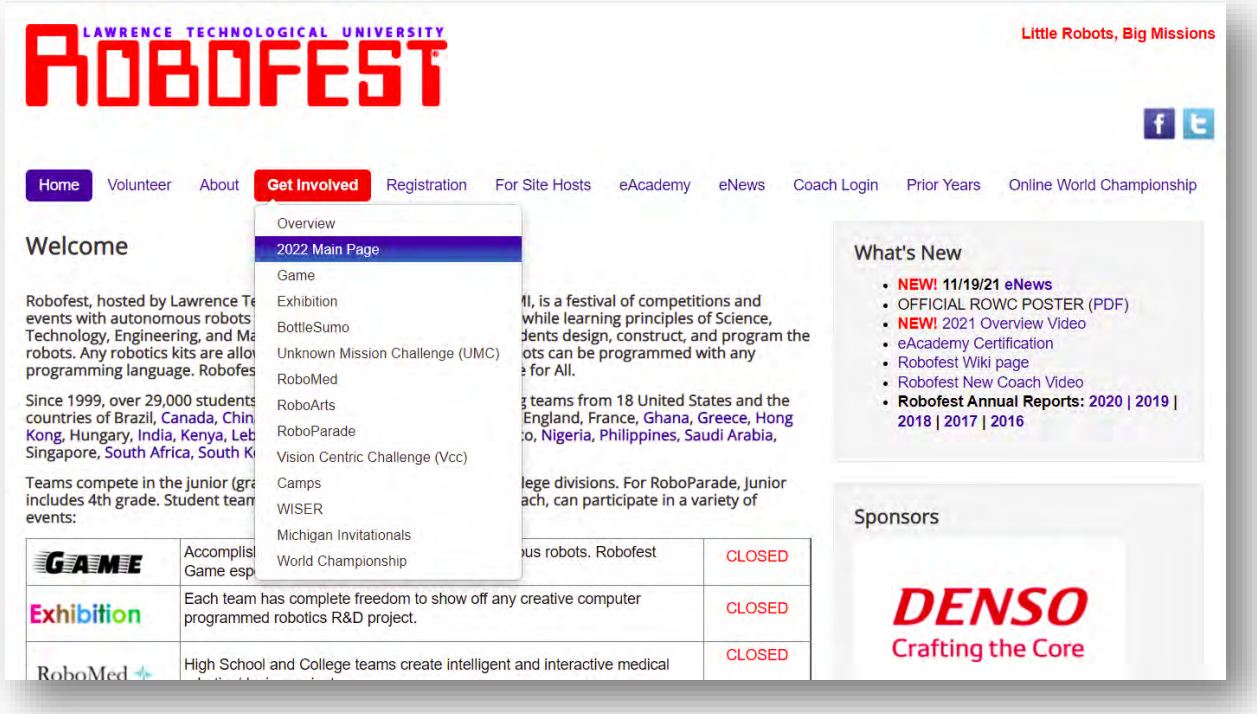
I will show personal integrity by honoring all Robofest rules, valuing fair competition and respecting judges and all other participants.

My team and I will do our own work. I will NOT receive outside help from coaches, mentors, electronic devices or other sources during competitions and I will strictly follow impounding procedures.

I pledge to make Robofest 2022 great by upholding the Spirit of Robofest.

2022 General Rules

- Official General Rules Document, and other important forms can be found on the robofest.net website under the **Get Involved→2022 Main Page**



- Coaches are responsible for communicating rules updates to contestants

Becoming a Robofest Team Coach

- Any teacher, school administrator, parent, tech specialist, or scientist/engineer is eligible to be a coach
- Coaches must be adults without a criminal record
- **Please note:** email is the primary and official communication method between Robofest and coaches – Update and confirm changes in coach profile
- Robofest Coach's Video to help new coaches get started - on line: robofest.net ➔ **Get Involved** ➔ Overview
- Coaches must agree to *and* abide by the 2022 Coach's Pledge:

Robofest Coach's Pledge

As a Robofest coach, I have read and agree to abide by the Robofest 2022 general and category specific rules as they exist now and as they may be set forth during the Robofest season.

As a coach, I am responsible for communicating and enforcing the Robofest rules to team members, team volunteers, and others affiliated with my team. I understand that any rule updates, guidelines, additional information, and announcements will be communicated to me, officially via emails, or webpage updates. I am responsible for reading the information and I will relay it to all the people affiliated with my team. If any changes are made to my email account, I will notify Robofest administrators as well as update my coach profile.

As a Robofest coach, I understand that the students come first. Robofest is about the students learning computer technologies, science, engineering, and mathematics. Everything my team does starts and ends with the principle: the students do all of the work. My team members will do the designing and building of the robot, problem solving and programming. Adults can help them find the answers, but cannot give them the answers or make the decisions in detail.

I intend to uphold and maintain the Robofest spirit.

Team Coach Roles

- Recruit team volunteers, including technical mentors and assistant coaches
- Find team sponsors
- Facilitate team meetings and transportation to event(s)
- Register Teams for events-Enter and verify all team data
- For exceptions to student's grade, complete the *"Age Division Waiver Request"*
- Upload Team Photo and Robot Photo if desired
- Pay Registration Fee in the registration system
- Collect Consent & Media Release Form if not completed on line
- Coordinate Student pre & post assessment completion
- Follow all General and Category Specific Rules robofest.net ➔ **Get Involved**

Robofest Assessments and Surveys

- Participants will be assessed anonymously before and after the competition to see if participation in Robofest competitions increases their interest in STEM subjects and careers
- Pre-assessment/survey instructions will be sent to Coach in team registration confirmation
- Post-assessment/survey instructions will be sent to Coaches in April
- Results published in an annual assessment report as well as a journal on education research

Robofest Scholarship

Robofest team members who choose to attend Lawrence Technological University may apply for a $3,000 annual renewable scholarship (total of $12,000)

- Submit an application, located on the LTU.edu Scholarship website under the “Future Students/Portfolio and Private Scholarships” tab
- Submit a 400-word essay regarding your Robofest experience, your career goals
- Submit a letter of recommendation from one of your Robofest adult coaches or mentors
- Robofest can assist with letter of recommendation
- Submission Deadline: April 1, 2022

Volunteer Opportunities

Team Mentors & Workshop Assistants:

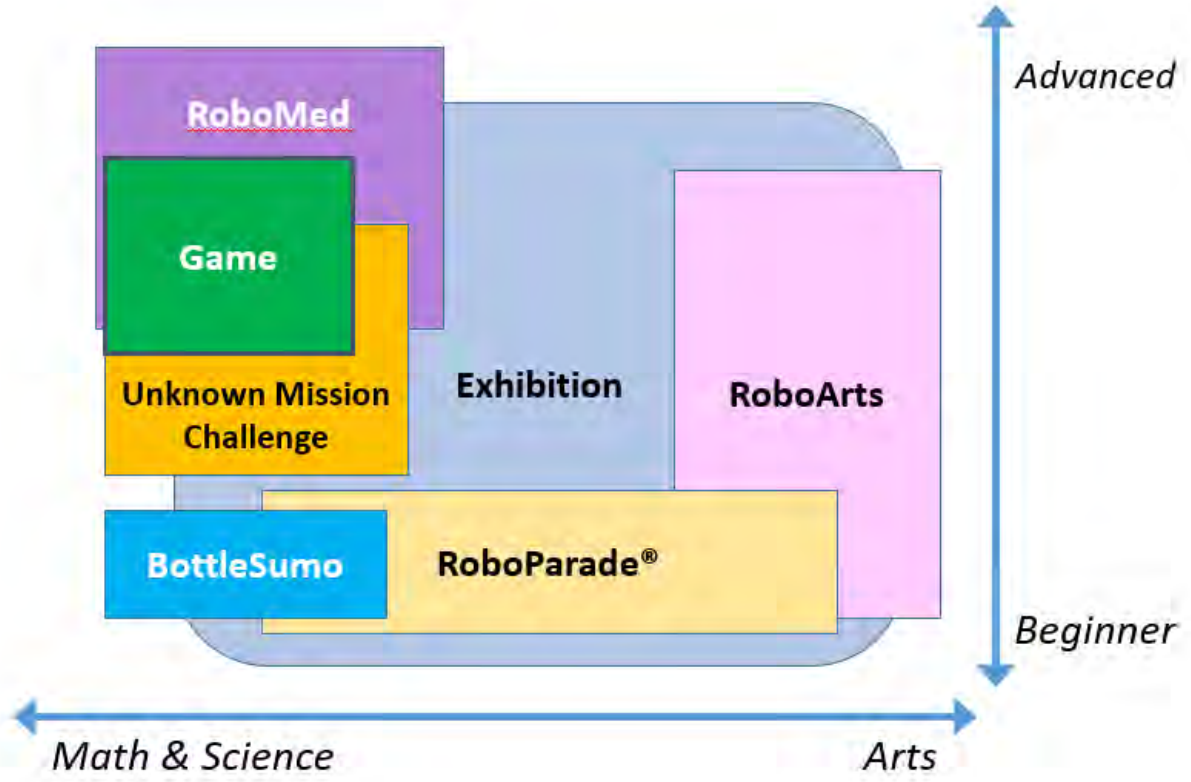
- Professionals from any industry
- Experienced Robofest participants of any age can volunteer Service Hours can be earned:
  - President's Volunteer Service Award
  - National Honor Society
  - Boy Scouts/Girl Scouts
  - School or Church
- Contact Elmer Santos esantos@ltu.edu

Judges and Event Volunteers:

- Needed for local events and Robofest Online World Championship, April ~ May 2022
- LTU Staff – Possibility for Comp Time
- Industry professionals welcome
- Former Coaches and participants welcome
- Training Provided
- Contact Pam Sparks psparks@ltu.edu

2022 Competition Season – 7 Opportunities

- Qualifying Competitions
  - Game
  - Exhibition
- Open Competition Categories
  - BottleSumo
  - RoboArts
  - RoboMed
  - RoboParade
  - Unknown Mission Challenge (UMC)



2022 Pre-Season Schedule

- **November 18**: International rules published
- **December 8**: Kickoff meeting Online
- **December 17**: US Team registration opens
- **January 15, 2022**: Kickoff meeting and Webinar
- **January 18**: Finalization of all category rules (clarifications and minor adjustments from kickoff meetings)
- **January ~ March**: On-site technical workshops and online classrooms – registration open to competing teams
- **February 12**: Game Warm-up at LTU (Judge Training)

2022 Main Season Schedule

- **February ~ April**: US and International Qualifiers; Post-assessment survey sent to coaches
- **April 18**: Video Submission deadline for US and International Video Qualifier Game and Exhibition teams
- **April 18**: Video Submission deadline for Virtual Regional Screening of Winning US Exhibition teams
- **April 21**: Video Qualifier and Virtual Regional teams notified of advancement to World Championship
- **April ~ May**: Robofest Online World Championship Events

2022 Workshops

- No Registration Fee
  - Teams must be registered and paid for a Qualifier
  - Pre-registration Qualifier site is available
- On campus workshops in Computer Science Robotics Lab - J234
- Students can register for multiple workshop types (categories/languages)
- To see all workshops,click on “coach login” ➔ “Available workshops”
- Schedule:
  - Sat, Jan 22, 9:00am ~ Noon: **VEX IQ with Robot Mesh**
  - Sat, Jan 22, 1:00pm ~ 4:00pm: **LEGO EV3 with Scratch for Game**
  - Sat, Mar 12, 9:00am ~ Noon: **LEGO Spike Prime / Robot Inventor with Scratch**
  - Sat, Mar 12, 1:00pm ~ 4:00pm: **VEX IQ with VEXcode**
  - Sat, Mar 19, 9:00am ~ Noon: **LEGO Spike Prime / Robot Inventor with Python**

Robofest Online World Championship Synchronous – Zoom Platform

CATEGORY	ONLINE SYNCHRONOUS
	Date
Sr UMC	Fri Apr 8
Jr UMC	Sat Apr 9
Sr Bottle Sumo Time Trials	Fri Apr 22
Jr Bottle Sumo Time Trials	Sat Apr 23
Sr Exhibition Finals	Fri Apr 29
Jr Exhibition Finals	Sat Apr 30
Sr Game Finals	Fri May 13
Jr Game Finals	Sat May 14
Award Ceremony	Sat May 21

Robofest Online World Championship Video Submission

CATEGORY	VIDEO SUBMISSION
	Due Date
RoboArts	Fri, May 6
RoboMed	Fri, May 6
RoboParade	Fri, May 6

Qualifier Categories

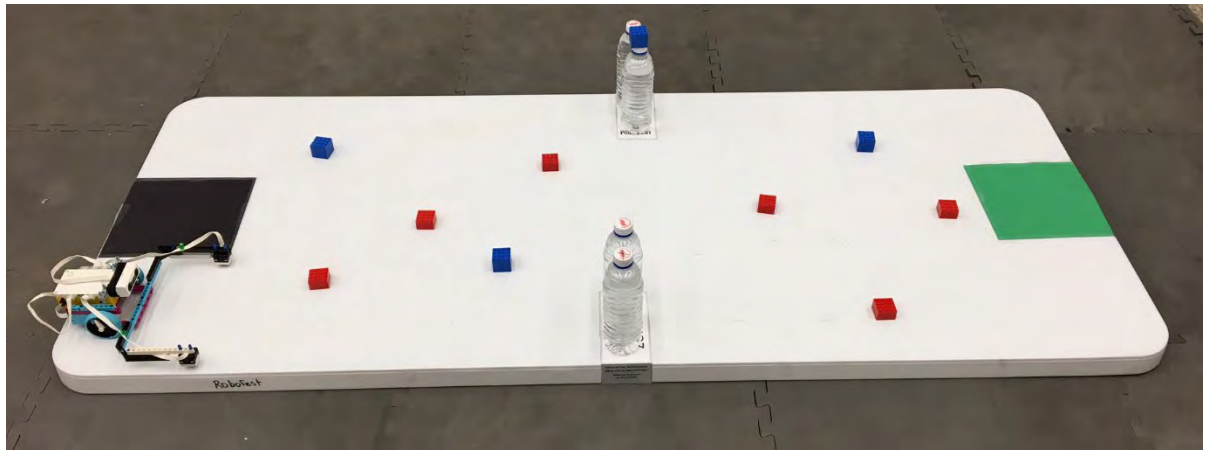
Teams must compete at a 2022 In-Person, Online or Video Qualifier in order to advance to the World Championship event

Competition Category	Age (Grade*) Divisions	Maximum Team Size	Robot Platform	Unknown Factors	Note
Game	Jr. (5th-8th) & Sr. (9th-12th)	5	Any	Partially unknown	Each team uses a fully autonomous robot to play this year's game, **OceanBots**
Exhibition	Jr. (5th-8th) & Sr. (9th-12th)	5	Any	Lighting Conditions	Teams have complete freedom to show off a creative autonomous robotics project

(*) School Grade in spring 2022 - For exceptions to student's grade, complete the online *"Age Division Waiver Request"* at the time of registration

OceanBots

(Environmental Rescue and Clean Up)



- Jr and Sr Divisions
- Max 5 members per team
- Must advance from a qualifying competition to compete at the World Championship
- For detailed rules, scoring sheet, example videos, etc., go to robofest.net → **Get Involved** → **Game**

- Develop a robot that moves 2 Turtles (blue blocks) and 6 Trash objects (red blocks) from the table into their respective targets AND bring 2 Turtles onboard the robot
- For a game run, max 2 minutes are given and one full-reset is allowed
- All the tasks must be done autonomously without any external help
- UTF (Unknown Task and Factors) will be unveiled just before the 30 minute work-time

Exhibition

- Complete freedom to show off any type of creative intelligent robotics project -Robotics Science Fair
- Must employ sensors
- Human to Robot, Robot to Robot interaction strongly encouraged
- Wireless program controlled remotes are allowed only if the program of the remote controller is written by students
- Space for project is limited to **64** square feet including a 6ft or 8ft table

Exhibition

- Four minutes are given for an official presentation including demonstration. Team is responsible for keeping the time
- Sharing online videos (such as YouTube) is required prior to Qualifiers so judges can prepare questions –Upload to team registration page
- Code Submission is required prior to Qualifiers so Judges can review code – Instructions will be provided

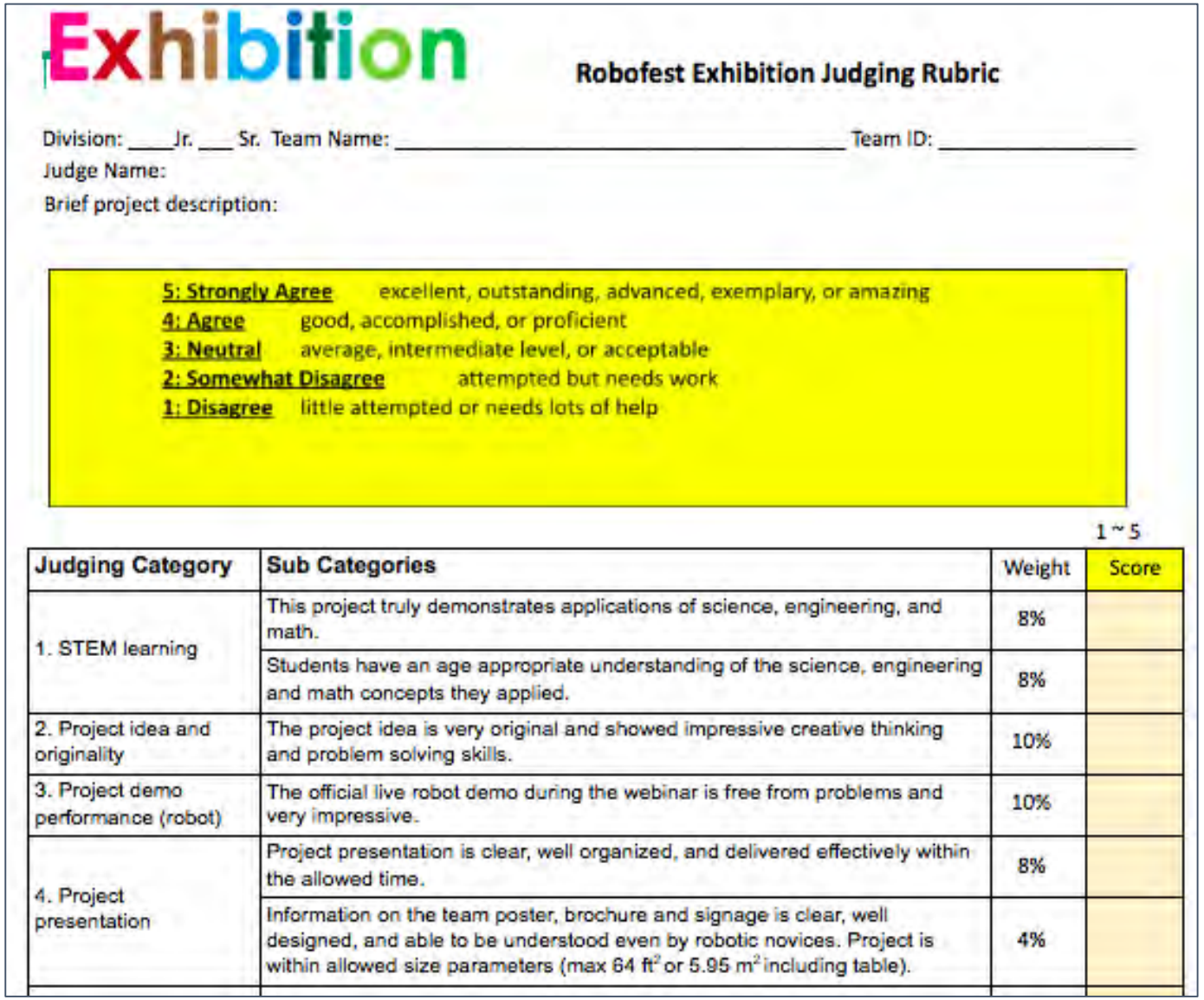
Judging

Rules and Rubric: robofest.net → **Get Involved** → **Exhibition**

- The application of math and science theories which are appropriate to the team members' age level is a strong plus for judging. Not appropriate to the age level is OK, but it may not give any advantages for the judging
- One member team is allowed

Exhibition Judging Rubric

Similar Rubric is used for RoboArts and RoboMed



Exhibition

Robofest Exhibition 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

			1 ~ 5
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%	
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%	

Exhibition Judging Rubric

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 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 02-3-2021

Open Categories

- Any team from around world (except from Member Countries) may register online as long as space is available, with no qualification necessary

Competition Category	Age (Grade*) Divisions	Max Team Size	Robot Platform	Unknown Factors	Competition Venues:
RoboArts	Jr. (5^{th}-8^{th}) Sr. (9^{th}-12^{th})	5	Any	Lighting Conditions	Local Sites & Robofest Online World Championship, Hosted by Robofest (Video Submission)
RoboParade	Jr. (4^{th}-8^{th})	5	Any	Lighting Conditions	Local Sites & Robofest Online World Championship, Hosted by Robofest (Video Submission)
RoboMed	Sr. (9^{th}-12^{th}) College	5	Any	Lighting Conditions	Robofest Online World Championship, Hosted by Robofest (Video Submission)

(*) School Grade in spring 2022 - For exceptions to student's grade, complete the online *"Age Division Waiver Request"* at the time of registration

Open Categories

Competition Category	Age (Grade*) Divisions	Max Team Size	Robot Platform	Unknown Factors	Competition Venues:
Unknown Mission Challenge (UMC)	Jr. (5th-8th) Sr. (9th-12th)	4	LEGO NXT, EV3, SPIKE Prime, or VEX IQ	Fully unknown	Robofest Online World Championship, Hosted by Robofest
BottleSumo+ and BottleSumo Time Trials++	Jr. (5th-8th)	3	LEGO NXT, EV3, SPIKE Prime or VEX IQ	Partially unknown	+Local Sites ++Robofest Online World Championship, Hosted by Robofest
	Sr. Classic (9th-12th)	3		Partially unknown	
	Sr. Unlimited (9th-12th)	3	Any	Partially unknown	

(*) School Grade in spring 2022 - For exceptions to student's grade, complete the online "*Age Division Waiver Request"* at the time of registration

RoboArts

- Similar to Exhibition, but projects are specifically focused on the visual and performing arts
- Jr. and Sr. Divisions
- Max team size: 5 members
- Rules: robofest.net → **Get Involved** → RoboArts

RoboParade

- Robots are constructed and programed by student participants to follow the parade route, detect other vehicles, stop and start without human help
- Jr. Division -Includes 4th Grade (no waiver needed) Perfect for beginners
- Max team size: 5 members
- 2022 World Championship Event Theme: **Preserve our Natural Resources**
- Rules: robofest.net → **Get Involved** → **RoboParade**

RoboMed

- An Open Category competition at the World Championship for intelligent and interactive (bio) medical robotics/device projects
- The project must be related to (bio)medical and healthcare fields using sensors and/or actuators
- RoboMed competition promotes an entrepreneurial mindset. Sentences about “Opportunity Recognition” and “Value Creation” are encouraged in the project description
- Two age divisions
  - Senior Division (Grades 9-12)
  - College Division (Undergraduate including Community College students)
- Max Team Size: 5 members
- Rules and Judging rubrics: robofest.net → **Get Involved** → **RoboMed**

UMC

- Missions are completely unknown until day of challenge
- Jr. and Sr. Divisions
- Only LEGO NXT, LEGO EV3, LEGO Spike Prime, and VEX IQ robot kits
- All robot components must be un-assembled at the beginning of the competition
- Max team size: 4 members
- Rules: robofest.net → **Get Involved** → UMC

BOTTLESumo

- Be the first robot to intentionally push a bottle off the table OR be the last robot remaining on the table
- Jr. Division –Only LEGO NXT, LEGO EV3, LEGO Spike Prime, and VEX IQ
- Sr. Classic Division: Only LEGO NXT, LEGO EV3, LEGO Spike Prime, and VEX IQ
- Sr. Unlimited Division-Any robot platform
- Max team size: 3 members
- Rules: robofest.net → **Get Involved** → **BottleSumo**

Competition Format and Fee Schedule – US

- Registration Fee paid to LTU Robofest
- Applied to each event
- Site Host may request additional site check-in fee to cover costs
- No refunds will be given
- Teams who advance to the Robofest World Championship will pay a separate World Championship Registration Fee to LTU Robofest

Event/Format	Hosted by	Fee	Competition Materials (Certificates, Medals and Awards)
Qualifier - Online	US Hosts LTU Robofest Office	$75	Robofest automatically ships to Teams after completion of event
Qualifier - Video Submission	LTU Robofest Office	$75	Robofest automatically ships to Teams after completion of event
Qualifier - In-Person	US Hosts	$75	Robofest Ships to Site Host – SH presents to teams at event
Open Events at Qualifying Competitions *May differ by site	US Hosts	$75*	Robofest Ships to Site Host – SH presents to teams at event

Competition Format and Fee Schedule-International

- **Some International Site Hosts may have different fee structure**
- Applies only if Registration Fee is paid directly to LTU Robofest

- No refunds will be given
- Sites may request additional site check-in fees
- Teams who advance to the ROWC will pay a separate Registration Fee to LTU Robofest

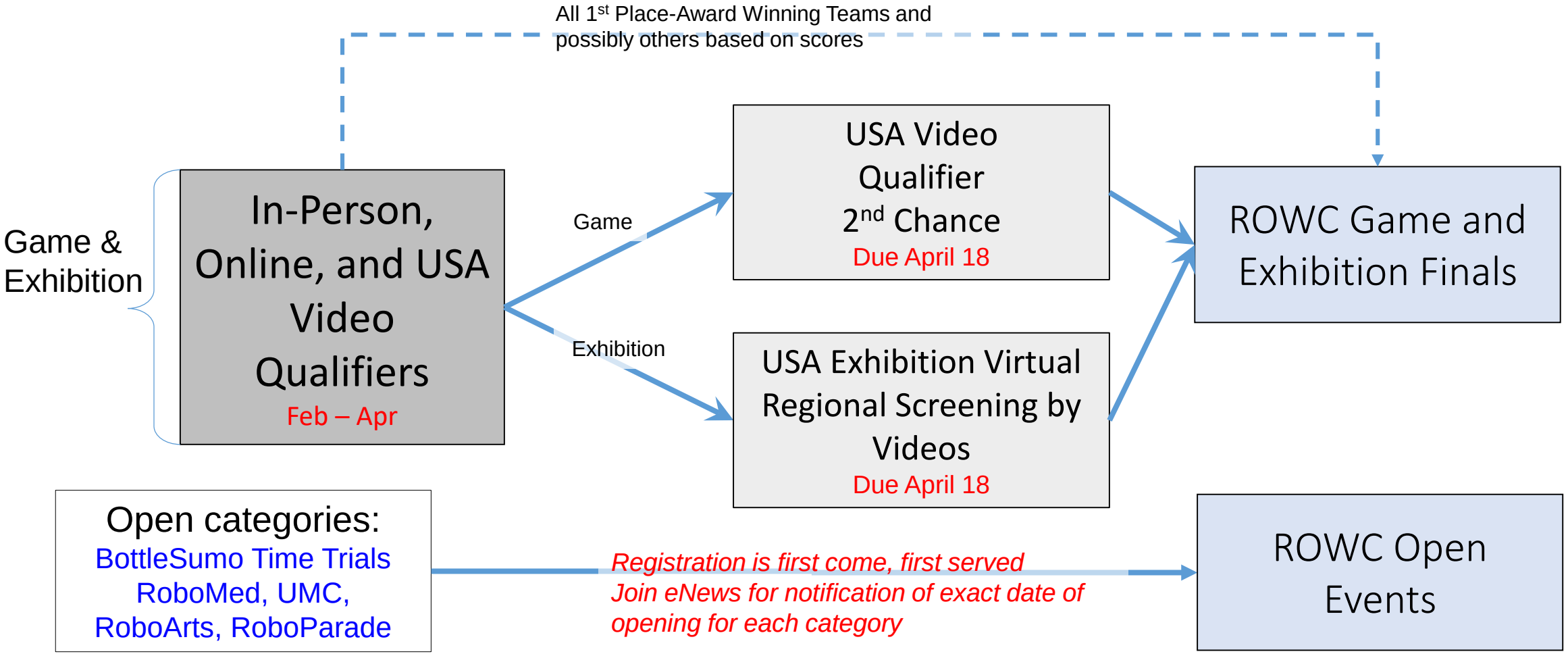
Event/Format	Hosted by	Fee	Competition Materials (Certificates, Medals and Awards)
Qualifier - Online	International Hosts	$75	Site Host ships to Teams after completion of event
Qualifier - Video Submission (teams from non-member countries)	International Hosts LTU Robofest Office	$75	Robofest ships to Teams after completion of event
Qualifier - In-Person	International Hosts	$75	Teams receive items at event
Open Events - In-Person *May differ by site	International Hosts	$75*	Teams receive items at event

Format and Registration Fee Schedule – Robofest Online World Championship

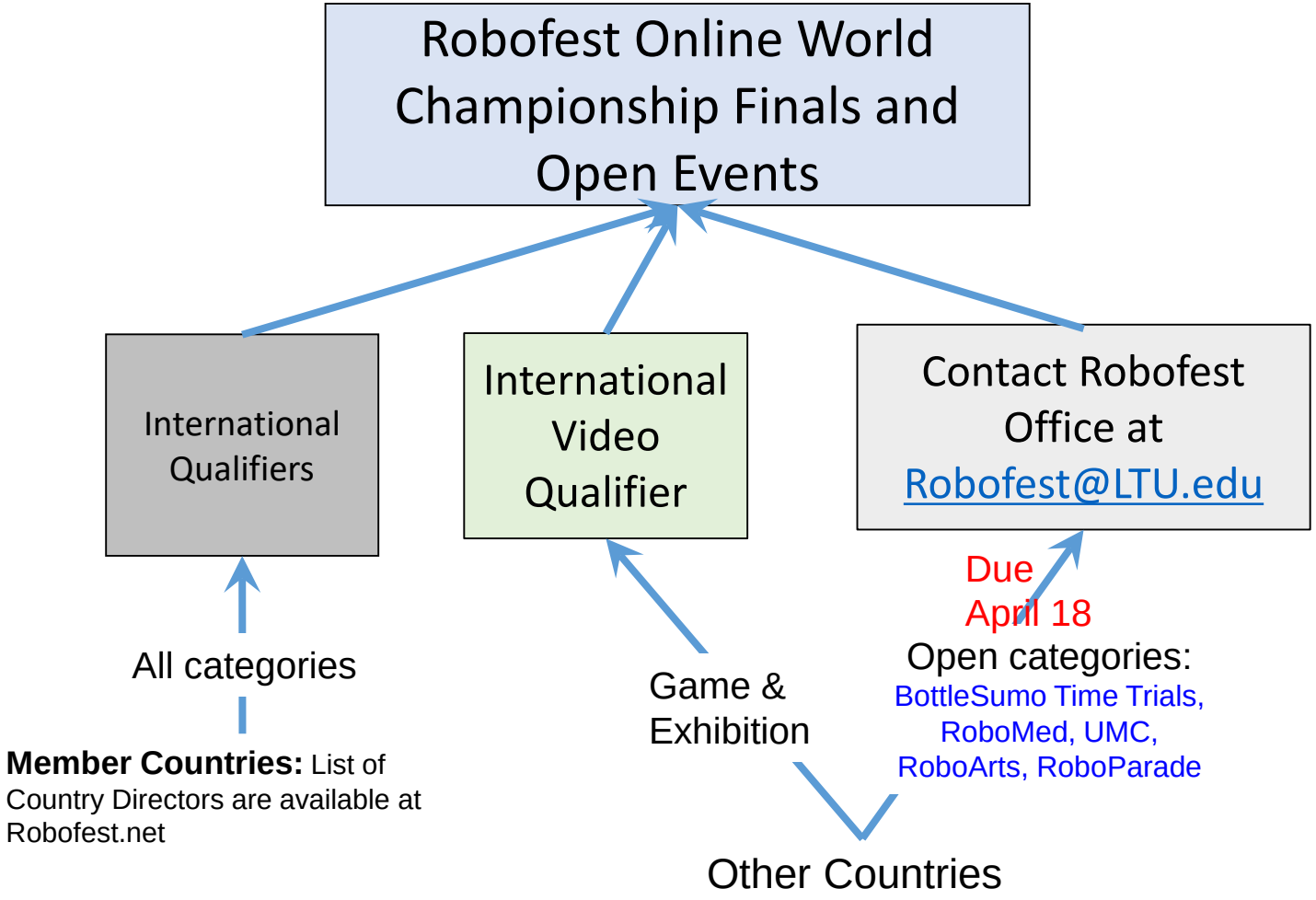
- Registration Fee paid to LTU Robofest
- Applied to each Category
- No refunds will be given

Event/Format	Hosted by	Fee	Competition Materials (Certificates, Medals and Awards)
Synchronous Online • Game Finals • Exhibition Finals • UMC • BottleSumo Time Trial	LTU Robofest Office	$75	Robofest automatically ships to Teams after completion of event
Video Submission • RoboArts • RoboMed • RoboParade	LTU Robofest Office	$75	Robofest automatically ships to Teams after completion of event

Advancing to World Championship – US Teams

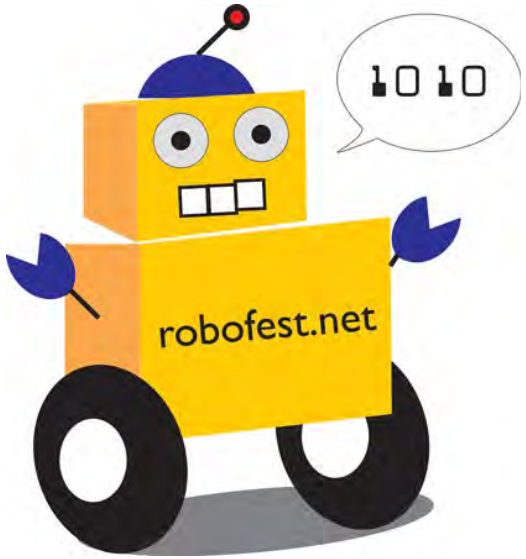


Advancing to World Championship – International Teams



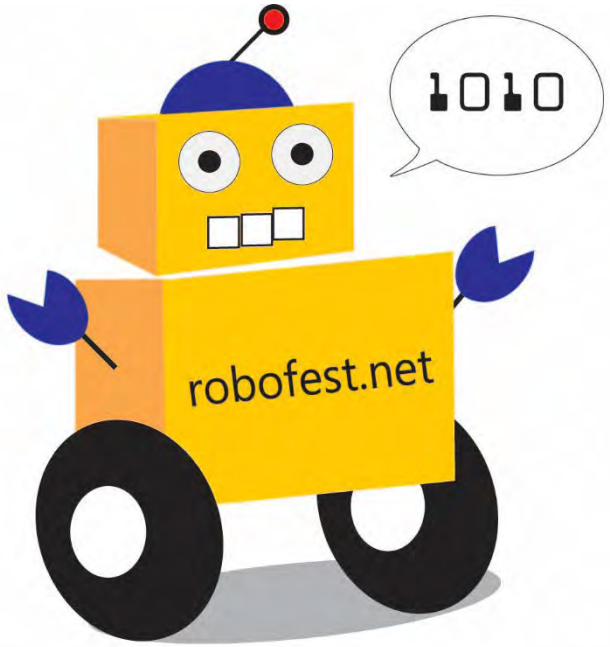
Questions?

Thank you!



Send questions, comments, corrections, and suggestions to robofest@LTU.edu

join the Robofest eNews list at robofest.net!



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ROBOFEST®

2022 Game Presentation will begin shortly