

10th Annual ROBOFEST[®] 2009 Rules

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This file may be revised or refined during the season. Check out www.robofest.net for new versions. Changes after v0.4 version are in red color.



9th Annual World Robofest Championship, April 26, 2008, Southfield, Michigan

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- Consent, Release and Media Authorization Form: <http://www.robofest.net/2009/ConsentReleaseForm.pdf>
- Age Division Waiver Request Form:
<http://www.robofest.net/2009/ageWaiverForm.pdf> or <http://www.robofest.net/2009/ageWaiverForm.doc>
- Robofest Video Submission Form
<http://www.robofest.net/2009/RobofestVideoSubForm.doc> or
<http://www.robofest.net/2009/RobofestVideoSubForm.pdf>

Part 1 – Robofest 2009 General Rules

Robofest® is an affordable annual robotics competition to increase young students' interest, engagement, understanding and use of science, technology, engineering, and mathematics (STEM) through autonomous robotics. Robofest is an open competition, allowing teams to use any type of robotics platform and any programming language for the various competition categories shown in Table 1.

Competition Category**	Age Divisions	Team Size	Platform	Unknown Problems	Assessment	Reg. fee*	Note
Game - RoboZone	Junior (5-8 th) and Senior (9-12 th)	Max. 7 student	Any	Yes	Yes	\$50	Each team uses a fully autonomous robot to play this year's game, RoboZone; See Part 2
Exhibition	Junior (5-8 th) and Senior (9-12 th)	Max. 7	Any	No	Yes	\$50	Each team has complete freedom to show off any creative autonomous robotics project. See Part 3
RoboFashion & Dance Show	Junior (5-8 th)	Max. 7	Any	No	Yes	\$50	Two robots are recommended. Limited qualifying sites. See Part 4.
Collegiate Mini Urban Challenge	Senior (9-12 th)	Max. 3	Vision based L2Bot	Partly unknown	Yes	\$50	Talented high school students who are interested in computer science can participate. See Part 5.
	College				No		
VEX Elevation (Assoc. Event)	Senior (9-12 th)	10	VEX	No	No	TBD	Fri. May 8 and finals on May 9 at Lawrence Tech. Organized by Cranbrook Schools. Check out www.robofest.net/elevation
Warehouse Firefighting (Assoc. Event)	Senior (9-12 th)	Max. 7	Flutter bot	Partly unknown	Yes	TBD	May 9 at Lawrence Tech. Organized by Flutterbot. Check out www.robofest.net/firefighting

(*) No refunds will be given; some qualifying sites may charge \$20 ~ \$25 Check-in fee per team; International sites may use different fees; World Championship Check-in fee per team is \$40

(**) Special competition category for every team: Team Photo Contest – See Part 1, section 11.

Table 1. Robofest 2009 Competition Categories

1. General Team Registration Rules

- Team registration is processed on the web at <http://www.robofest.net> (*Enter Robofest 2009 Link*).
- The registration deadline is 21 days (3 weeks) before the competition date at each site. If a division at a site does not have 5 teams or more, teams registered at the site may be moved to another site; or teams can enter via video submission (see Section 9),
- There may be a \$20 ~ \$25 check-in fee at a qualifying competition site, which will be used solely by the qualifying competition organizer. Each qualifying site web page under check-in fee section specifies whether the site requires the check-in fee or not.
- All contest sites are open to the general public and admission is free.
- Teams from an organization are registered by a registered coach; a coach may have multiple teams at one qualifying site.
- A team that consists of both junior and senior students is not allowed (see Section 3).
- Any organization, such as a school, home school, civic organization, club, etc. can form team(s).

2. Team Coach Qualification and Responsibilities

- Coaches must not do the direct work for the team's robots. They should teach and/or provide necessary training for the team to solve the challenge problems. Robofest provides some technical workshops at LTU and/or online; there may be books or online resources available as well; some multimedia curriculum is available for purchase. Coaches are encouraged to contact local IEEE chapters (Robofest medal sponsor), ACM chapters, engineers' societies, robotics clubs, colleges, or universities to find volunteer technical mentors.
- The coach is responsible for registering, entering, and updating his/her team information by the update deadline. Note: the Robofest organizer prints personalized certificate directly based on the data entered by coaches.
- **A new and very important role is to coordinate pre and post assessments. See section 7.**
- The team coach is responsible for facilitating, transporting, and overseeing team members.
- The coach must have a valid email address and must check the email account periodically. Email is the primary and official communication method between the team and the Robofest organizer. If a coach's email address is changed, it is the coach's responsibility to update the Robofest registration system by logging into the coach's Robofest account and making the change. To confirm an email address change, the system will send the coach a confirmation email. The coach will need to confirm by clicking on a link in the confirmation email.
- Any teacher, school administrator, parent, college student, professor, tech specialist, or scientist/engineer is eligible to be a coach. Coaches must be adults without any criminal record.
- Robofest 2009 has multiple qualifying competition sites. A coach using a coach ID must register teams for only one qualifying site. It is allowed, however, for a coach to setup another coach ID for another qualifying site to register teams on a different date.
- We recommend that coaches recruit technical mentors or assistant coaches if necessary. The coach is responsible for entering on the web up to 5 volunteer names and their roles.
- Each coach must provide at least one volunteer for helping with either setup or cleanup at the hosting site. Each hosting site will send detailed information to the volunteers.
- The coach is responsible for entering/updating the team data. Note that personalized certificates will be printed based on the information and the photos on the website. The Robofest organizer will not reprint certificates for free due to incorrect information on the web. Please see the last section about Reordering Certificates and Trophies.
- **For 2009, Robofest introduces a web-based assessment as an experiment for teams. Each coach is supposed to help with Robofest administration to gather data and analysis regarding students' learning in STEM subjects.**
- Robofest attracts lots of media attention. Coaches must collect [Consent & Release Forms \(PDF file\)](#) not only for students, but also for coach him/herself and team volunteers. These must be submitted to the hosting site during check-in, preferably by a coach.
- Another important role of the coach is to find sponsors for their team(s). Team sponsors are individuals, groups, companies or other organizations that donate cash, products, or in-kind services to the team. The Robofest website will list up to four team sponsors per team on the web.
- Before and after Robofest, please contact newspapers, radio, and TV stations to recognize your teams' efforts and achievements. Let Robofest admin (robofest@LTU.edu) know if your teams were introduced in any media outlets.

3. Student Team Members

- Junior Division participants are 5th-8th grade and Senior Division participants are 9th-12th grade students, in April 2009.
- For any exceptions, the coach must submit "Age Division Waiver Request Form" to Robofest administration for approval. The general rule is that playing up is fine as long as the student has exceptional talent in construction of the robot *and* computer programming, and has the maturity to work with other team members. Playing down is discouraged in general. The reason to request playing down must be specified on the form. For either playing up or playing down, coaches should obtain consent from entire team and their parents. See the attached Waiver Request [Form](#).

- Though not recommended in general, a team member may join multiple teams, if the team coach approves. For example, a student can join a game team and an exhibition team from the same school/organization.

4. Registration & Assessment Process (Seven Steps)

- Step 1. **Coach Registration** will begin on the web at www.robofest.net in December 2008. After the online registration form is submitted, a coach ID and password will be sent to the coach by email immediately from admin@robofest.org. You must confirm the coach registration by clicking a link in the email confirmation sent to you; otherwise the coach registration has not been completed. If you do not receive the confirmation email, contact robofest09@gmail.com or 248-204-3569 to resolve the problem. (This may be due to either the system/network has been down or an incorrect email address in the coach registration form.) Also please check your spam folder, before contacting us. Veteran Robofest (2003 ~ 2008) coaches can use their prior coach ID and password. If you forgot your password, click on the "Forgot Password" link. If you forgot your coach ID number, please contact Robofest09@gmail.com or 248-204-3569.
- Step 2. **Team Registration** will begin right after the kick-off meeting on December 11, 2008. Using the coach ID and password, the coach can create teams *after selecting one qualifying site*. During this step, the coach must accept the Robofest 2009 Coach's Pledge (Appendix 1). All the team member names, grades, and gender must be entered (student contact information is not made public). Each team must provide at least one volunteer who will help with qualifying competition site setup or cleanup. The volunteer's name and email address needs to be entered. For exhibition teams, a short exhibition description must be entered in this step. It must include the theme of the exhibition, functionalities of the robots, the number and types of sensors and motors used, and any other information that describes the exhibition. Please register early, since a competition division of a site will be closed when the number of teams registered is equal to the max capacity for the division.
- Step 3. **Registration Fee Payment**: After creating all of your teams, pay the registration fee online using a major credit card through PayPal. You will receive a payment confirmation email from PayPal, which can be used as a receipt. Or, you may choose the option to send a check to:
LTU Robofest, 21000 West 10 Mile Rd., Southfield, MI 48075, USA.
 Make the check payable to LTU Robofest and make sure to include the team number(s) in the Memo line of the check. Please include a hard copy of the payment page from the web when you mail the check. Your team registration will be complete once LTU receives the check.
- Step 4. **Pre-Assessment**: Print the Consent & Release form and send it to students' parents. Get the signed forms from parents. An email with pre-assessment instruction will be sent to the coach. See also section 7.
- Step 5. **Team Photo Uploading**: Take a team photo and upload it to the coach account on the web. The requirements for the photos are: (1) standard **landscape** "jpg" file (width: height ratio should be 4:3 or 16:9) (2) size should be less than 350KB – if not, the file will be automatically resized (3) must show all the team members listed (4) adult coach and volunteers may be in the picture (5) must show the identifiable team ID and team name (write down or print the number on a paper and hold it when taking the photo **or** edit the photo file to add text). The team ID number is decided in **Step 2** above. If no photo is uploaded before the update deadline, certificates for the team will not have team and/or robot photos. The photo must be uploaded within **3** weeks after the team registration. There will be special prizes for Best Team Photos.
- Step 6. **Robot Photo Uploading & Final Update**: Take a photo showing your team robot(s). Upload the photo using the coach's web account two weeks before your qualifying competition date. The robot photo requirements are the same as in (1), (2), and (5) in step 5 listed above. At this step, coaches must be sure to update any team information on the web. The update deadline will be **10** days before the competition date for each qualifying site. This is a hard deadline, as time is needed to print and ship all the participant certificates to each site.
- Step 7. **Post-Assessment**: This is to gauge learning over the time frame of the competition. After the qualifying competitions, an email with post-assessment instruction will be sent to the coach. See also section 7.

The steps are summarized in Figure 1.

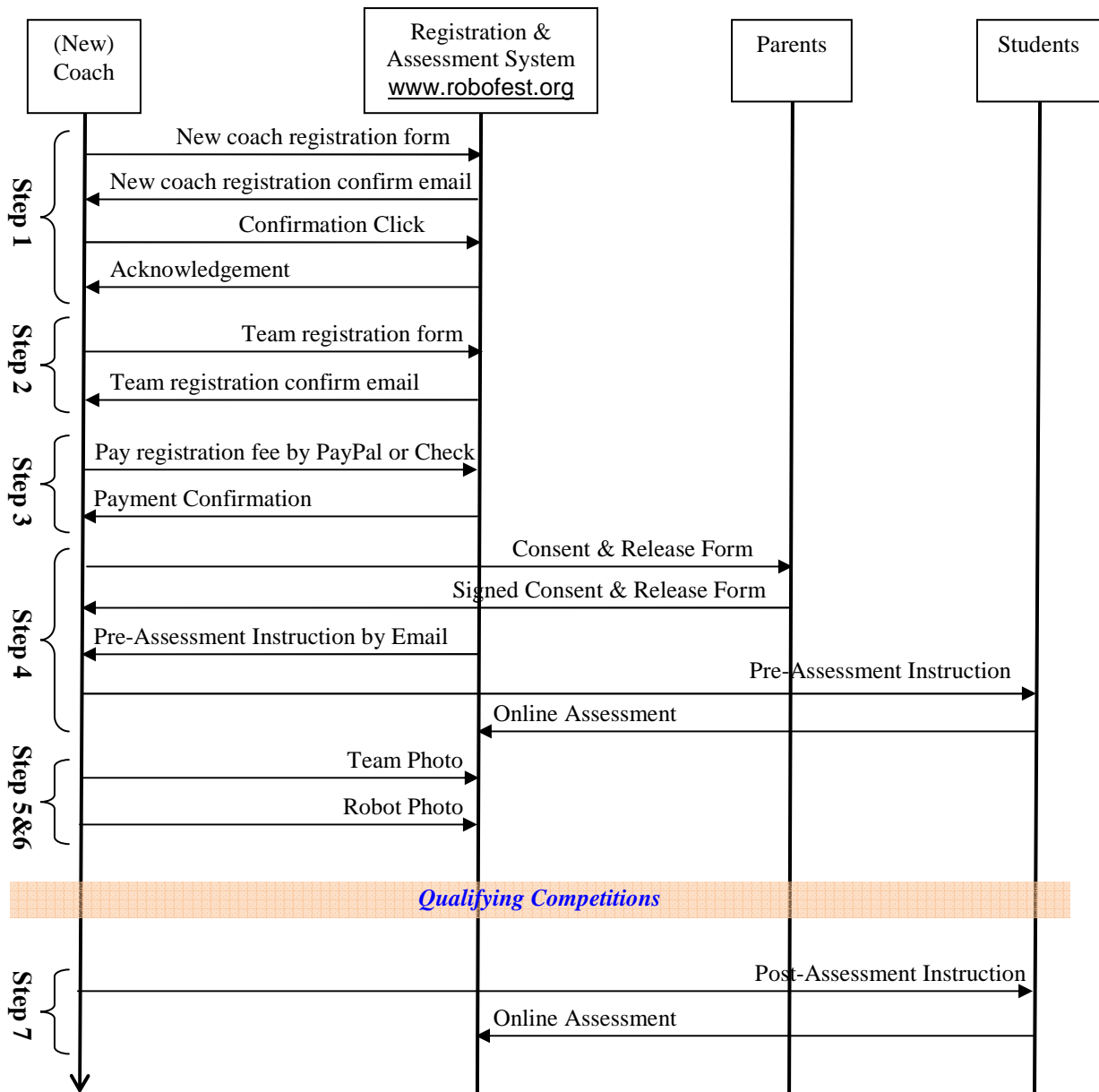


Figure 1. Team Registration & Assessment Process Summary

5. Team Volunteers

The team cannot work without the help of various volunteers for jobs such as mentoring, financial sponsoring, transportation, constructing playing fields, preparing food, taking pictures, or video taping, etc. The Robofest website will list up to five volunteers per team and a certificate of appreciation may be given to each team volunteer on the Robofest qualifying competition day. As mentioned in section 2 and 4, each team must provide at least one volunteer for the setup or cleanup of the hosting site. This will be a good opportunity for teams to preview the site and playing field setups.

6. Common Sense Rules for Education

Construction of the robot body as well as all programming for the student competition should be done solely by the students. Parents, teachers, mentors, or coaches may not directly assemble the robots or directly write the program code for the team at any time during the preparation period or during the contest. Any direct participation is a violation of the rules. The offending team will become ineligible for any awards.

Only team members with name badges will be allowed in the pit (team table) area during the competition. No adults are allowed in the pit area. If a team coach must enter the area, they must receive permission from one of the judging proctors. It is strongly suggested, for security purposes, that the coach have assistants watch the team table area, especially when the team is competing. The use of cell phones in the pit area by students is prohibited. WI-FI in the pit area must be turned off.

7. Robofest Assessment

For the Robofest 2009 season, we will begin to assess the impact of autonomous robotics competitions in Science, Technology, Engineering, and Math (STEM) education. Competitions can drive students to work harder resulting in improving skills. We believe that students participating in robotics competitions will hone STEM skills and demonstrate skills they would not have gained outside of the competitions. To prove this we need measurable data to quantify the student's experiences. We can use this data to highlight successes and determine areas of improvement. The purpose of the assessment is to quantify and analyze students' improvements in STEM skills through autonomous robotics competitions that require computer programming as a major work. The result will also show how effective a robotics competition is at educating them. They will be assessed before and after the competition to see the level of improvement. Another group of students who did not participate in the competition will act as a control group, and take the same pre and post assessments.

To accomplish this task, a set of web-based database tools has been developed at the Robofest.org site to allow for easy test creation, collecting data, and data analysis. This assessment research will be published in a journal on educational technologies. This assessment is 100% anonymous. To promote participation, we plan to offer raffle prizes to participants.

8. Team's Responsibility on Robofest Competition Day

- All the teams must observe the check-in time set by the host organizer for each site.
- Things to bring to Robofest venue
 - ❑ Robot(s) and spare parts
 - ❑ A laptop or other computer for each team. (To solve the unknown challenge or adjust to the lighting condition each team must bring a computer. It is **not** recommended that teams share computers.)
 - ❑ *Only for exhibition teams*: poster boards to introduce the exhibition description and all the necessary materials for the exhibition.
 - ❑ A power strip and power cable
 - ❑ Lego RCX robot teams only: Cardboard box to cover your robot and IR tower
 - ❑ Extra batteries
 - ❑ Signed Consent & Media Release forms for team members, coach, and team volunteers – required.
 - ❑ Check-in fee, if your qualifying site charges a check-in fee. Check out your site home page.
- Teams must use the team table assigned by the organizer. Please do not change team tables. If you change, judges and the organizer *will not be able to* find your team.
- Read the competition rules carefully.
- *Lego RCX robot teams only*: whenever new programs are downloaded, both your robot and the IR tower **MUST** be covered by a box. If not, you may damage other robots and/or your program may be corrupted. Do not forget to bring an IR opaque cardboard 'garage' to house your robots and IR tower.
- Also see attached "Typical Qualifying Robofest Competition Schedule", Appendix 2.
- General Rules During the Robofest Competition:
 - ✓ No food or drink is allowed inside the contest area.
 - ✓ Flash photography is not allowed inside the competition area
 - ✓ Do not make unnecessary noise which might disturb other teams in the pit area. Be respectful of all teams.

9. Rules for Video Submission Entry

If there is no qualifying site near the team location (or under special circumstances) the teams may register on-line for Video Submission. Video submission teams are required to pay the same registration fee. The coach must submit a signed [Robofest Video Submission Form](#) when sending the video to:

LTU Robofest
21000 West 10 Mile Rd.
Southfield, MI 48075, USA.

It must be postmarked by the deadline, Sat. April 11, 2009. The video can be made by adults. The following are the suggested video contents:

- Start with the team and team member introduction, around 5 seconds for each member.
- Introduce features of the robots, around 5 seconds for each robot.
- Demonstrate the games or exhibitions; the video should not be edited, once the demo has started.
See RoboZone game rules as well as the submission form for details about how to prepare the video.
- Rolling credit and/or acknowledgement (recommended).
- Acceptable video media: VHS, CD with a video file, Video CD, or DVD

Adults may help produce the video. If students were involved in the video production work, it should be acknowledged in the credits. **Please also include hard copies of the source programs.**

10. Judging and Prizes

About **25%** of the total number of teams at each qualifying site will win trophies that will be presented during the award ceremony. Detailed Judging rules are explained in each competition category later in this document. Every officially registered team member will receive a certificate of achievement and IEEE sponsored medal during the award ceremony of the qualifying competition. All teams must stay for the closing ceremony.

11. Special Competition: Team Photo Contest

The best team photos will be selected from the uploaded official team photos. Every team is automatically entered once their team photos are uploaded. Selected team photos will be posted on the web and presented on a big screen during the World Robofest 2009 Championship before announcing the winners.

Selection criteria includes: team spirit, unity, harmony, and uniqueness. In addition, we are checking to see that all the registered team student members are in the photo. Please be aware the time of posting the photo will be an important criterion in selection. A deduction will be made, if the team photo was uploaded more than **3** weeks after the team was registered.

12. The World Robofest 2009 Championship

The Robofest 2009 Qualifying Competitions will take place at several regional (U.S.) and international locations. There is a video submission option for teams who are not close to a competition location as discussed in section 9. Top teams from each regional competition site will qualify to move on to compete in the World Robofest 2009 Championship at Lawrence Technological University on Saturday, May 9, 2009. The team check-in fee will be \$40, tentatively.

Competition category rules found later in this document specify the details on how teams will be ranked during each competition. The total number of teams advancing from each qualifying site/competition category will be decided in proportion to the number of teams registered at the site. The exact number of teams qualifying for Worlds will be determined by Robofest Administration after registration closes.

Team Members of the top **Senior Division** teams at the World Robofest Championship in Game, Exhibition, and Mini Urban Challenge will receive \$2,000 LTU annual renewable scholarships as well as other prizes donated by Robofest 2009 sponsors.

13. Reordering Certificates and Trophies

Robofest is pleased to announce a new systematic service: we have decided to provide certificate re-printing services with minimum charge. Also, winning teams can order multiple trophies with individual names on a fee basis. Certificates of award can also be issued on a fee basis.

Part 2 – Robofest 2009 Game Competition Rules

The name of the challenge for the 2009 competition is “RoboZone”. Although Robofest allows up to 7 members, we recommend 4 or 5 members per team to better engage students.

Details about the game rules on the web at: <http://www.robofest.net/2009/roboZone.pdf> (These rules may be revised or refined during the season.) Streaming videos of the practice games is available on the web at www.robofest.net

Part 3 – Robofest 2009 Exhibition Competition Rules

The robotics exhibition is a great way for students to show off their imagination and creativity. Each team has complete freedom to create autonomous robotics projects such as robot pets, robot artists, dancing robots, storytelling with robots, robots for scientific experiments, and practical robotics applications. Teams are composed of one to seven members. In general, two students are recommended per robot. Computer controlled robots may be of any size and can use any material as long as it is safe for team members as well as spectators. Even though human controlled remote is not allowed, *unlike the Game*, wireless host computer control is allowed.

On the day of the Robofest competition, each exhibition team will be given a table on which to demonstrate the robots. After the opening ceremony, teams will have 4 minutes to explain and demonstrate their robotics project to the public possibly using a microphone. Judges will visit the team table to ask additional questions anytime before the final judging. “Silent Judges” will visit teams throughout the day to check presentation methods and attitude for spectators. These Judges will not identify their roles.

Teams must bring all the necessary materials for the exhibition. For example, if the exhibition needs background music, the team must bring an iPod, CD or audiocassette tape. The sound system in the hosting site may **not** be available to play your music. **Therefore, it is highly recommended to contact the site host in advance and/or bring a player too.** Teams are requested to bring poster boards to describe their projects. Hardcopy of programs to give to Judges is a plus, but not required. If the team has posted video clips on the web, show them to the judges.

We highly recommend each exhibition team publish a video clip on a video sharing site such as SchoolTube (www.SchoolTube.com). Judges will use this to preview the team projects **and the team will get better scores for the presentation methods category. Therefore, show the video to Judges just in case they did not watch the video.** The exhibition team coach can update the video information and the URL using his/her Robofest account.

Awards and advancing to World Robofest are determined based on the following data:

Public demonstration performance (reliability)	20%
Originality (creativity and imagination)	20%
Application of math and science concepts learned (NEW)	20%
Presentation methods and student attitude for spectators; Information on the team poster; Information on the Internet such as SchoolTube	10%
Source code and robot inspection	10%
Complexity and number of functions	5%
Usefulness / Practicality	5%
Entrepreneurial ideas and mindset	5%
New technologies used & other factors	5%

Part 4 – RoboFashion & Dance Show Rules

Robotics in education creates an innovative and simulating classroom environment, in which students have fun, are excited, and are motivated to learn math, science, and technology. The RoboFashion & Dance Show category has been created in order to get young people interested in math and science at a younger age.

In this competition, a team of robots will use the whole stage (without walls) to show off their costume, walk (driving), and performing dancing motions to music.

Detailed rules and judging rules can be downloaded from the web at <http://www.robofest.net/2009/RoboFashionShow.pdf> (These rules may be revised or refined during the season)

Part 5 – Collegiate –“Mini Urban Challenge” using Vision-centered Robots

The Defense Advanced Research Projects Agency (DARPA) is the central research and development organization for the US Department of Defense (DoD). They organized the famous DARPA Urban Challenge 2007 where Teams competed to build an autonomous vehicle able to complete a 60-mile long real-world urban course safely in less than 6 hours.

Robofest is inspired by the ambitious DARPA challenge and we are simulating a small indoor competition environment solely based on an onboard vision system. The contestants are to use a common robotic platform called L2Bot and they have to implement a vision guidance software system to allow the robot to maneuver a given course. There will be high school and college divisions. Detailed rules can be downloaded from the web at

<http://www.robofest.net/2009/miniUC.pdf> (These rules may be revised or refined during the season)

Part 6 – Associate Events

In order to promote robotics education, Robofest hosts the following associate events

- VEX Elevation: detailed rules are posted on the web at www.robofest.net/elevation
- Warehouse Firefighting: detailed rules are posted on the web at www.robofest.net/firefighting

Appendix 1:

Robofest 2009 Coach's Pledge

As a Robofest coach, I have read and agree to abide by the Robofest 2009 rules (<http://www.robofest.net/2009/robofest09rules.pdf>) as they exist now and as may be set forth or amended 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, primarily via emails and web updates. I am responsible for reading the information and I will relay them to all the people affiliated with my team. If there are any changes in 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 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, building, and programming of the robot. Adults may help them find the answers, but cannot give them the answers or make the decisions in detail.

Acceptance of this pledge signifies my intent to uphold and maintain the Robofest spirit.

This will be signed when coaches register team(s) on-line.

Appendix 2:

Typical Qualifying Robofest Competition Schedule

(Assumption: eight Jr. game competition, eight Sr. game, and five exhibition or Fashion Show teams; and **four** official RoboZone playing fields. There is no official lunch time, but a food concession stand can be open.)

08:00am	Doors Open and Check-In begins. Find your team table after check-in. Practice fields & official playing fields open for practice. Setup exhibitions.
9:00am	Opening Ceremonies
	National Anthem
	Opening Remarks
	Introduction of Judges
	Explanation of Robofest rules
9:20 – 9:25am	Unveiling the Unknown Problem Task for the Game teams
9:30am	Official presentation and demonstration of exhibitions (6 min x 5 = 30 min)
10:00am - Noon	Exhibition and silent judges will visit exhibition team tables for interviews
10:00am – 10:30am	Test and judging of the unknown problem task. Teams need to explain how they solved the problem. Judges may need to check their programs.
10:30am – 10:40am	Announce the ranking; Lottery for forming four groups (two Jr. groups and two Sr. groups) for the group-tournaments
10:45am – 11:45am	Game competition begins in four RoboZone rings in parallel. Each match will be ten minutes on average in length, which includes: <ul style="list-style-type: none"> • move-in (1 min), • team introduction (1 min), • match (up to 3 games, 7 minutes on average), and • move-out (1 min). Since there are 4 teams in a group, there will be six matches (4x3/2) for each group. Therefore, it will take around 60 minutes (10 min x 6 matches) before the two finals.
11:45am – Noon	Jr. Division Game Final match
Noon – 12:15pm	Sr. Division Game Final match
12:15pm	Break
12:20pm	<ul style="list-style-type: none"> • Recognition of Coaches, Teams, and Team Members: Coaches will award Medals and Certificates of Achievement to students • Take a group photo with everyone. Music is recommended at this time.
12:35pm	Awards and Closing Ceremony: Judges should line up and congratulate winning teams. See the illustration below. Also, announce the teams to advance to World Robofest.
12:45pm	Recognition of Volunteers Volunteer Group Photo / Cleanup

