15th LAWRENCE TECHNOLOGICAL UNIVERSITY ROBOFEST 2014

Kick-off Info Meeting

Wed Dec 4, 2013 - 3pm
Fri Dec 6, 2013 - 6:30pm
Sat Dec 7, 2013 - 10am

Please download this Power Point Presentation file and "The 2014 Rule Packet" PDF file) at www.robofest.net → 2013-2014 Programs → Overview

The (webinar) meeting will begin shortly.

Welcome to Robofest 2014

Little robots, ***Big Missions***

- Dr. CJ Chung, Prof. of Computer Science, Founder and Director, chung@ltu.edu
- Dr. Chris Cartwright, Associate Prof. of Math, Program Manager
- Dr. Joe DeRose
- Dr. Kurt Meister
- Prof. Keith Bozin
- Prof. Maurice Tedder
- Many other LTU professors

- Faith Kurily, Robofest Coordinator, fkurily@ltu.edu, 248-204-3568
- Teri Dubois, Associate Coordinator
- Kathleen Hadley, Assistant Coordinator
- Chris Parker, Program Assistant
- Many LTU student assistants

Robofest 2014 Kick-off Info Meeting Agenda

- Overview
- Rules for each Main Competition category
- Intro to open competition categories
- 2014 Registration
- Schedule
- Q & A

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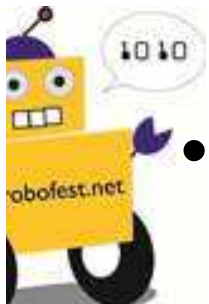
Goals of ROBOFEST

- Get students interested in STEM subjects and careers
- Increase preparedness for successful college education by increasing knowledge of STEM topics
- Promote students' innovative and creative thinking

Features of ROBOFEST

- Autonomous – Sensors required
- Challenging - dynamic playing fields, unknown factors, and **no** direct adult help allowed
- Any robotics system
- Affordable (reusing old kits; reg. fee: $50)
- Pre and Post Assessments (on-line)
- Qualifying Competitions, North American Championship & World Championship
- Age Divisions
  - Jr. Division: 5th – 8th
  - Sr. Division: 9th – 12th
- Variety of competition categories for more opportunities in STEM learning



2014 Season Opportunities

- Main Competitions
  - Game
  - Exhibition
- Other Open Competition Categories
  - Vision Centric Challenge (VCC)
  - BottleSumo
  - BottleZone
  - Unknown Mission Challenge (UMC)
  - Others at World Championship

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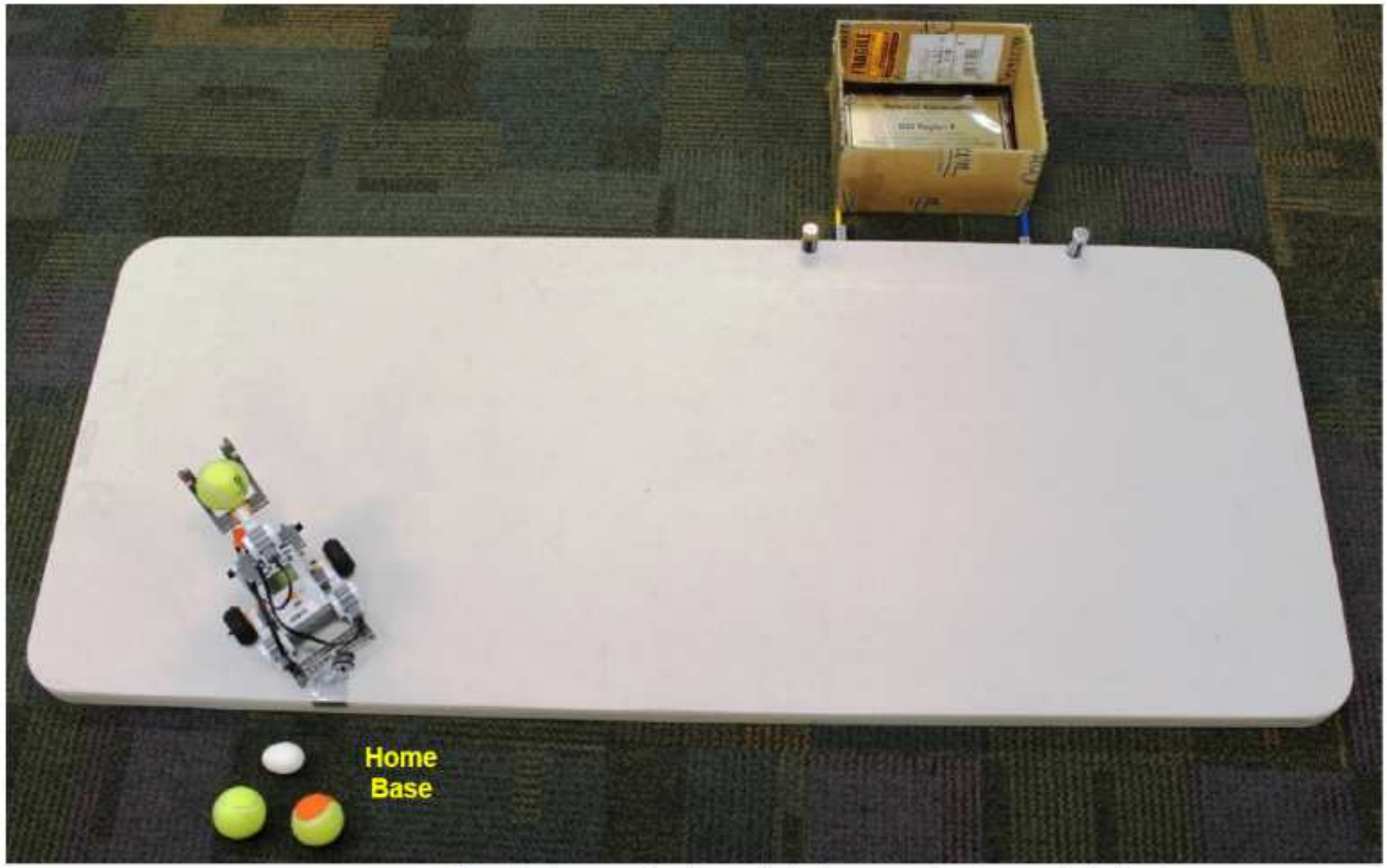
Main Competitions

Competition Category	Age Division	Team Size	Robot	Unknown factors	Assessment
Game – AMD	Jr. & Sr.	Max 7	Any	Yes	Yes
Exhibition	Jr. & Sr.	Max 7	Any	No	Yes

Team Registration Fee: $50

AMD: Avoid Meltdown – 2014 Game

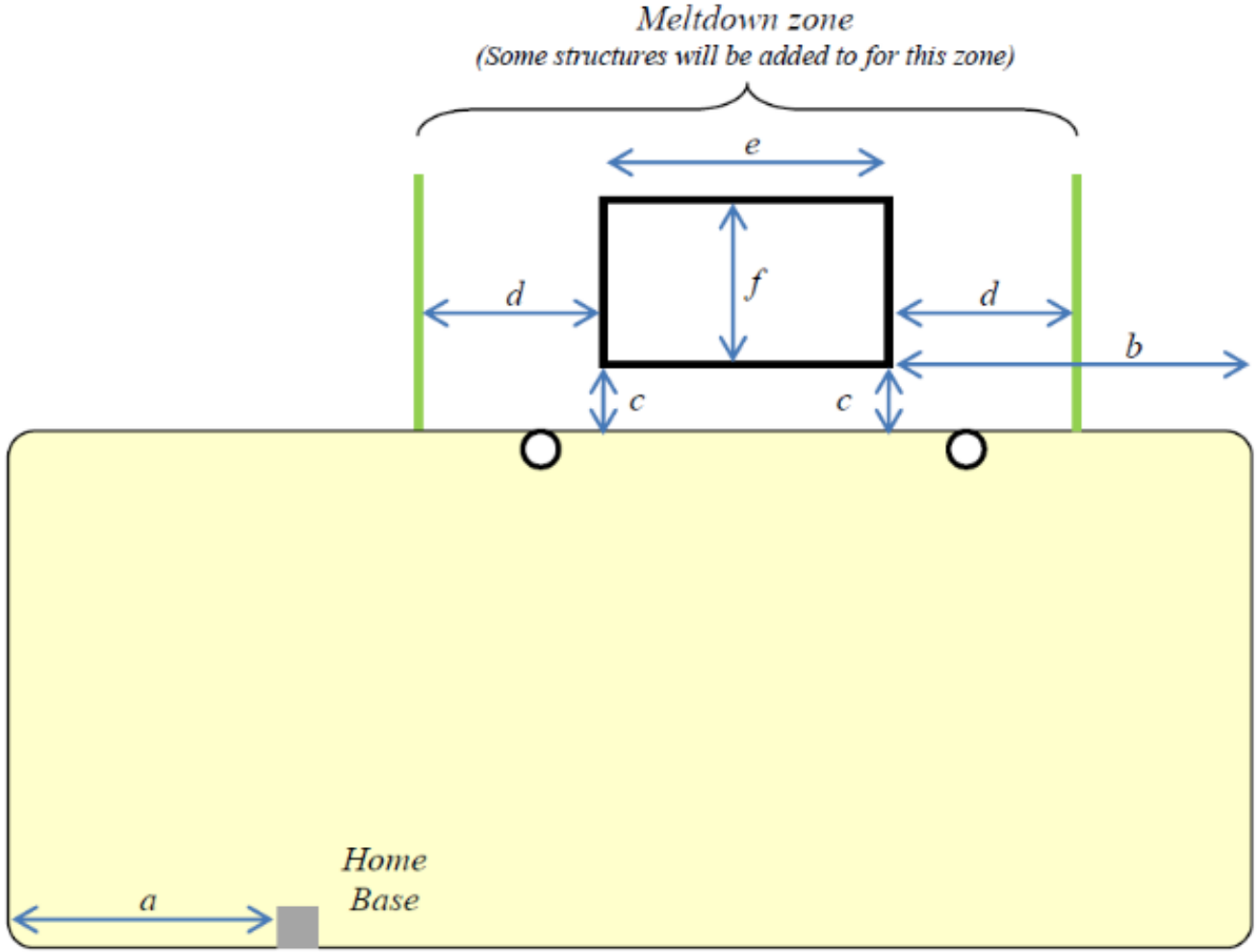


- Deliver 3 water balls (tennis balls) and 1 special ball (hardboiled egg)
- Remove concrete blocks (AA size batteries)
- *Measure the volume of the box in cubic centimeters*

2014 Game “AMD” Animation – 2 ways to watch

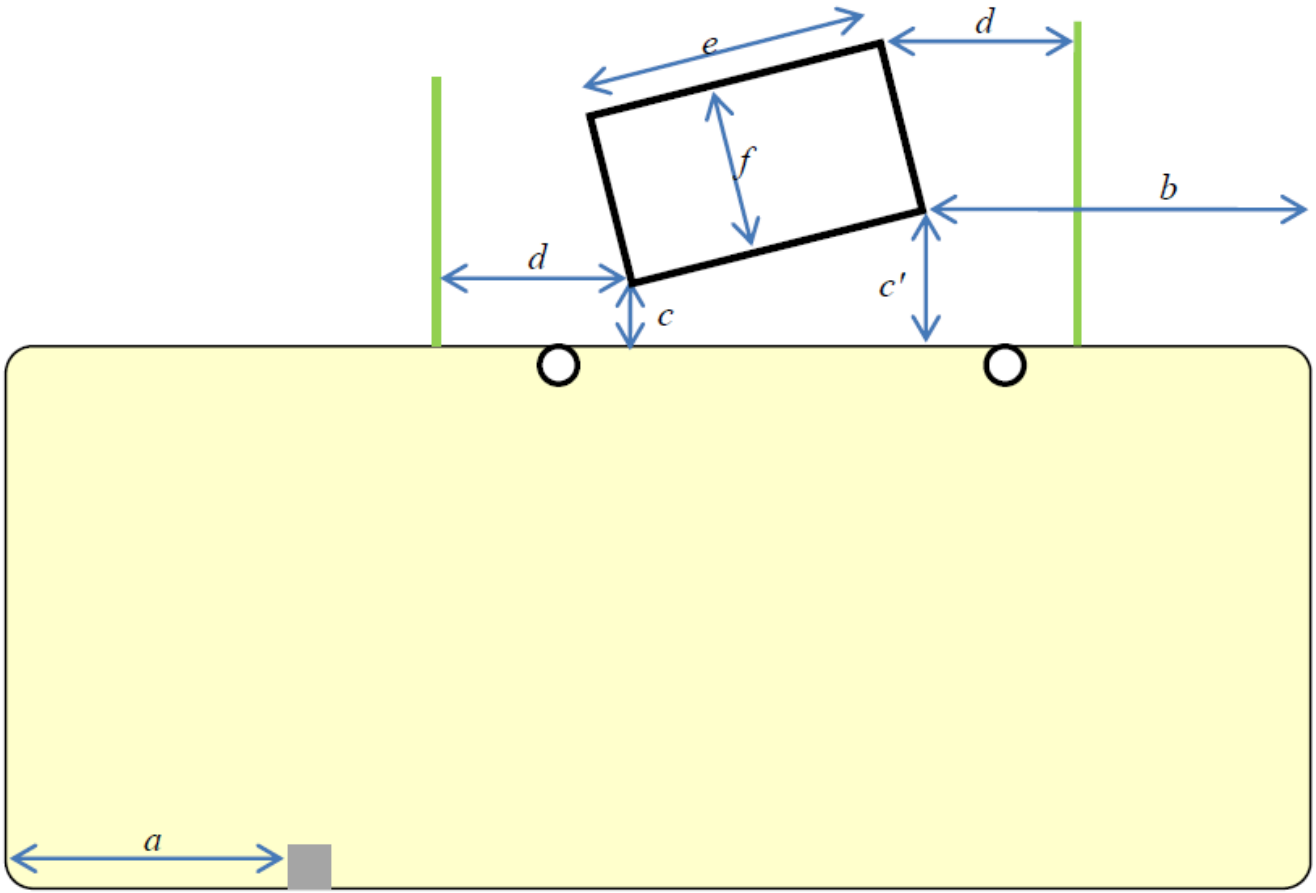
- Go directly to the following link: http://youtu.be/dFG2KL26l7U
- Go to www.robofest.net and click on “2013-2014 Programs” then “Game”
- More animation videos covering error cases will be available on the website

Playing Field Layout (Jr. Division)



	min	max	Unveiled?
a	25cm	40cm	No
b	30cm	50cm	No
c (fixed)	8cm (10 Lego size)	8cm	Already known
d (fixed)	21.6cm (shorter side of letter size paper)	21.6cm	Already known
e	20cm	50cm	No
f	20cm	50cm	Yes
Height of the box	15cm	50cm	Yes

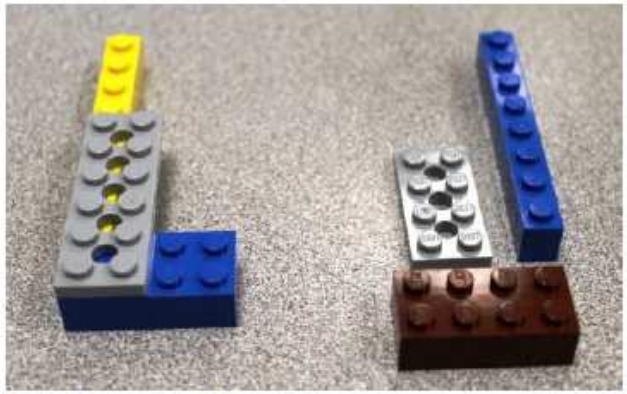
Playing Field Layout (Sr. Division)



	min	max	Unveiled?
a	25cm	40cm	No
b	30cm	50cm	No
c (fixed)	8cm (10 Lego size)	8cm	Already known
d (fixed)	21.6cm (shorter side of letter size paper)	21.6cm	Already known
e	20cm	50cm	No
f	20cm	50cm	Yes
Height of the box	15cm	50cm	No
c'	(c+3) cm	(c+10) cm	No
Table thickness	4cm	5cm	Yes

Box Set up

Between the table and the box, two simple Lego structures will be placed as shown below. The structure is a part of the playing field. Note the height of the structure is about 2cm. Color is unknown.



Rounds

- 2 rounds, 2 minutes per round
- Playing field configuration including box size may be different for each round.
- Teams will be given 30 minutes after unknown factors are unveiled.
- All teams must submit their robot to the impound area when 30 minutes has expired.
- After impounding, the judges will re-setup tables

How to start the robot

- Judge (or Emcee) will specify which way (starting orientation) the robot will face.
- Must be placed to start in the Home Base area as long as part of it is on or over the foil tape and it meets the size requirements
- May hang over the edges of the table.
- Width & Length: max. 35 cm
- Players may touch / modify only when the robot is on or over the Home Base – This is part of the Game time

Red Card (-2): max two times

- If any part of the robot is touched by a player outside of Home Base
  - ✓ The robot must be re-started from Home Base using the same start orientation
  - ✓ The team may (1) start without reset *OR* (2) request reset of the box(Red Card!)

Scoring Sheet (1)

Judging Items (*checked at the end of a game round*)		Count	Point Value (per count)	Score Earned / Lost
Water Ball	Not in the box, but it was touching the meltdown zone when dropped	0 1 2 3	5	
	Inside the box	0 1 2 3	15	Max. 45
Egg	Inside the box (not broken)	0 (no) 1 (yes)	20	
	Inside the box (broken)	0 (no) 1 (yes)	10	
	Not in the box, but it was touching the meltdown zone when dropped (not broken)	0 (no) 1 (yes)	10	
	Not in the box, but it was touching the meltdown zone when dropped (broken)	0 (no) 1 (yes)	5	Max. 20
Blocks	Off the table	0 1 2	5	Max. 10

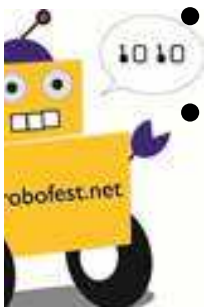
Scoring Sheet (2)

The robot measured the volume of the power plant, and reported the volume _____ (Measured Value) in cm^3 **at the end of the Game**.	0 (no) 1 (yes)	20	Max. 20
The robot remained intact throughout Game.	0 (no) 1 (yes)	5	Max. 5
Number of Red Cards that were given when a human player touched the robot, playing field, *or* the plant was reset	0 1 2	-2	Max. 0
** If Measured Value was "blank", Final Score is Total Score. If Measured Value is a number, calculate $e = \frac{\lvert CorrectValue - MeasuredValue \rvert}{CorrectValue}$ Final Score $= \begin{cases} Total\ Score - 17 & if\ e \geq 1.0 \\ Total\ Score - 15 * trunc(e,2) & otherwise \end{cases}$	**Total Score** Max. possible is 100		
	Final Score ** Calculated by Scorekeeper using Excel. Not to be rounded.		

*Truncation function **trunc(e,2)** means 2 decimal places will be left after truncation, i.e. errors under 1% will be ignored.*

Robot Specifications (Both Jr. & Sr.)

- Initial maximum width and length is 35cm x 35cm (the robot may expand automatically after starting)
- Expansion is allowed. But the max size cannot be bigger than 70 cm. Note that 75.5 cm is the width of the table.
- Height and weight limitation: none
- Any number of sensors/sensor types (unless it is harmful to humans)
- Any number/type of motors/servo motors (multiplexor is OK to use)
- Any material/robot kit may be used to construct your robot including tape, glue, bolts and nuts, rubber bands, etc.
- Team ID tag on top of the robot is required.
- Number of controllers (brains): see next slide



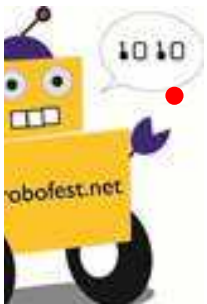
Jr. & Sr. Differences Summary

	Jr. Division	Sr. Division
Grades	5~8th	9~12th
Box orientation	Parallel to the table	Not parallel to the table
Math skills	trigonometry not required	trigonometry may be required
Number of controllers (programmable main brain)	One	No limit
Recommended Programming Language	GUI based (Visual programming) language	C or Java

[Table 3] Jr. and Sr. Division differences

FAQs (1)

- *Can the egg be in a package and the package can be dropped into the box?* Yes. (Package design should be ready and easy to put on if required. Any package application is part of 2 minute time. Egg removal and checking time by Judges is not part of 2 minute time.)
- *The robot does not need to come back Home by itself at the end?* True.
- *What if the robot reports the volume after the game not at Home Base?* That is allowed.
- *Can Jr teams adjust the height of the robot after the box information is unveiled?* Yes. Jr. teams may need to bring additional parts.
- *Is there a required sequence of missions?* No
- *Can we ask for a reset of the box when the robot is in action?* No, only when the robot is at the Home Base.
- *Can we ask for a box reset without penalty when the robot is over Home Base?* No. A Red Card is given, whenever the box is reset, if the maximum red cards have not already been given.



FAQs (2)

- *I grabbed my robot. Can I restart my robot without the box reset?* Yes.
- *Must the robot stop at Home Base?* No. But it is desirable to make it stop. A player may pick it up at the Home Base without penalty.
- *Do the Judges stop the clock to reset the box?* No.
- *Can a robot still display the volume after the 2 minute time runs out?* Yes, without any penalties.
- *Can a player reset the box?* No. It must be done only by Judges. Remember: you will be asked to restart if you touch the box. A penalty will be assessed.

FAQs (3)

- *Robot came back Home on its own and the human player did not touch the robot when loading the ball and restarting. Must the robot use the same starting orientation?* No.
- *Are teams permitted to have multiple programs?* Yes.
- *Are the size and weight of the egg known?* No.
- *Can teams package the egg before the start of the game?* No. Only during the 2 minutes.
- *Can teams use a tool to precisely measure the starting angle?* No.

Exhibition Competition Category

- Complete freedom to show off any type of creative autonomous robotics project - Robotics Science Fair
- Must employ sensors
- Human to Robot, Robot to Robot interaction *strongly* encouraged
- Sharing online videos (such as YouTube) is highly recommended.

Exhibition Example Projects

- Visit www.robofest.net and click on Prior Years, then Prior Year Exhibitions.
- Videos and pictures
- All the top winners since 2002

Exhibition Judging

- 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: OK, but it may not give any advantages for the judging.
- Wow! factor & demo performance
- Originality & Creativity
- …
- You can view the Exhibition Judging Rubric online by going to www.Robofest.net → 2013-2014 Programs → Exhibition and clicking on "View Exhibition Judging Rubric")

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2014 Open Competition Categories

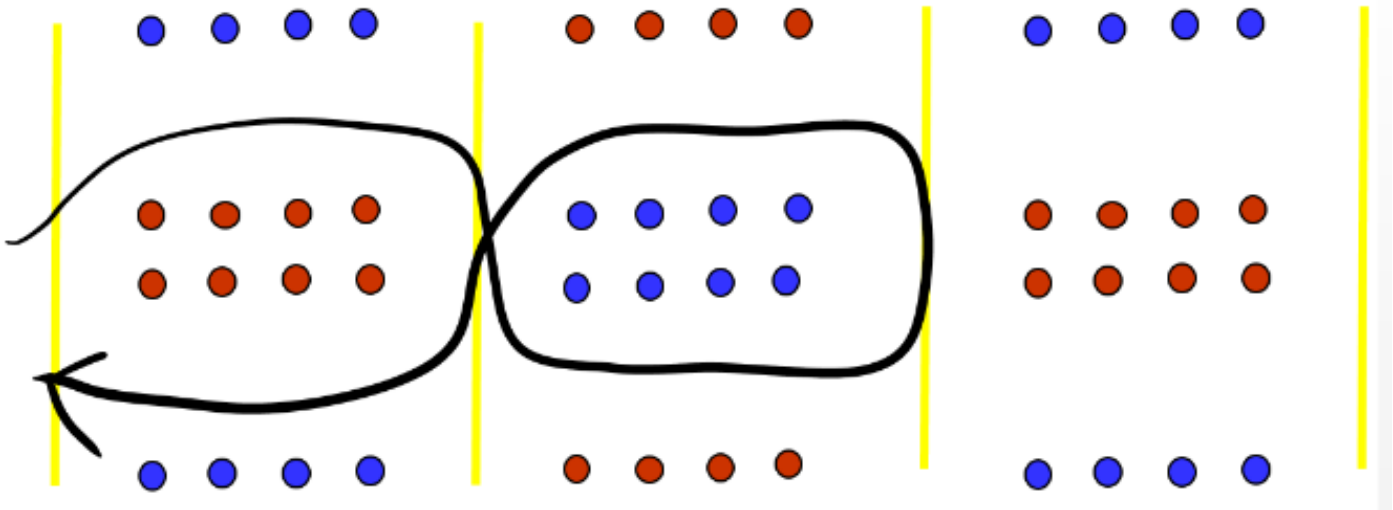
- Open competitions that do not require a qualifying competition
- North American Championship and World Championship
- First come, first served. Space is limited. Register and pay registration fee early!

Open Competition Categories

Competition Category	Age Divisions	Team Size	Platform	Unknown factor	Reg. fee per team	Note
Vision Centric Challenge (VCC)	Sr. (9-12th)	Max. 3	Any vision based robot	Partially unknown	$50	For Talented high school and college students. Competitions will be held at NAC and World Championship
	College	Max. 2	Any vision based robot	Partially unknown	$50	
BottleSumo	Jr.	Max. 3	Any	Partially unknown	$50	NAC and World Championship
BottleZone	Sr.	Max. 3	Any	Partially unknown	$50	NAC and World Championship
Unknown Mission Challenge (UMC)	Jr. & Sr.	Max. 3	Lego NXT	100%	$50	NAC and World Championship
Other 4 ~ 5 Competitions by WC host organizer	TBD	TBD	TBD	TBD	$50	World Championship

Vision Centric Challenge (VCC)

- Vision based Robot obstacle course race for advanced high school/college
- This year the challenge is Colored Cup Navigation
- Open event, does not require a qualifier
- VCC Rules: www.Robofest.net → 2013-2014 Programs → VCC



BottleSumo

- Be the first robot to push intentionally a bottle off the table OR be the last robot remaining on the table.
- Open event, does not require a qualifying competitions
- For Jr. division only
- www.Robofest.net → 2013-2014 Programs → BottleSumo

BottleZone

- The objective of the game is to find a square shiny zone and be the first to (intentionally) occupy it for three seconds.
- Open event, does not require a qualifying competition
- For Sr. division only
- Rules: www.Robofest.net → 2013-2014 Programs → BottleZone

Unknown Mission Challenge (UMC)

- Open event, does not require qualifier
- Jr and Sr divisions
- Missions are completely unknown until day of challenge
- UMC Rules: www.Robofest.net → 2013-2014 Programs → UMC

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May 29-31, 2014
In South Korea

World Championship

May 2-3, 2014
at Lawrence Tech

North American Championship

Qualifying Competitions

Open Categories

Game/Exhibition

2014 Qualifying Sites for Game/Exhibition

- United States: MI, HI, TX, FL, IN, MO, CA …
- Video Submission Site (see next slide)
- International: Canada, Korea, Mexico, South Africa…
- Check out the complete list at robofest.net → 2013-2014 Programs → Overview

- Early date qualifying sites will advance more teams to North American Championship than later date sites!

Submitting a Qualifier Video

- Video Submission in Game and Exhibition is available to teams who do not have a Robofest Qualifier in close proximity
- Game teams: contact robofest@LTU.edu prior to the submission to get unknown factors
- When submitting a video, the coach must include the signed submission form available http://www.robofest.net/2014/RobofestVideoSubForm14.pdf
- All videos must be *received* by Friday April 11, 2014, Noon EDT
- Sending the video link by email is the preferred method

Recognition of Video Submission Teams

- Medals and Certificates will be mailed to each coach
- Winners will be decided by Judges appointed by Robofest office
- Winner's trophies will be shipped to the coach

North American Championship (NAC)

- Top teams from each qualifying competition in North American will advance to NAC
  - NAC will be held at LTU May 2-3, 2014
- Open category competitions (do not require participation in a qualifying competition) will be held Friday May 2, 2014 as part of NAC

World ROBOFEST Championship

- Daegu, South Korea May 29-31, 2014
- Any team that participates in a qualifying competition can attend World Championship this year
- Winners from Qualifiers and NAC will receive some travel support. NAC winners will receive greater travel support.

Team Photo Contest

- A team picture needs to be uploaded within 3 weeks after the team registration ***and*** at least 10 days prior to the competition.
- Selection criteria: team spirit, unity, harmony, uniqueness, etc.
- Winners will be announced during the World Championship

Registration FAQ

- Can a coach register multiple teams at a site: Yes
- Can a coach using one coach ID register teams in multiple sites? Yes
- Can a student be a member of multiple teams?
  - Yes, but not the same category

Registration Deadline

- 21 days (3 weeks) before the competition date
- 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

Becoming a Team Coach

- Any teacher, school administrator, parent (not necessarily from a school), tech specialist, or scientist/engineer is eligible to be a coach.
- Coaches must be adults without criminal record.
- Please note: email is the primary and official communication method between the team and the Robofest organizer.
- Coaches must agree to *and* abide by the 2014 Coach's Pledge

Roles of Team Coach

- Recruit team volunteers, including tech mentors and assistant coaches, if needed
- Find sponsors
- Responsible for facilitating team meetings
- Responsible for entering/updating the team data and uploading team & robot photos
- Collect Consent & Release forms to submit at all event check-ins
- Coordinate online pre & post assessment

Age Division Waiver Requests

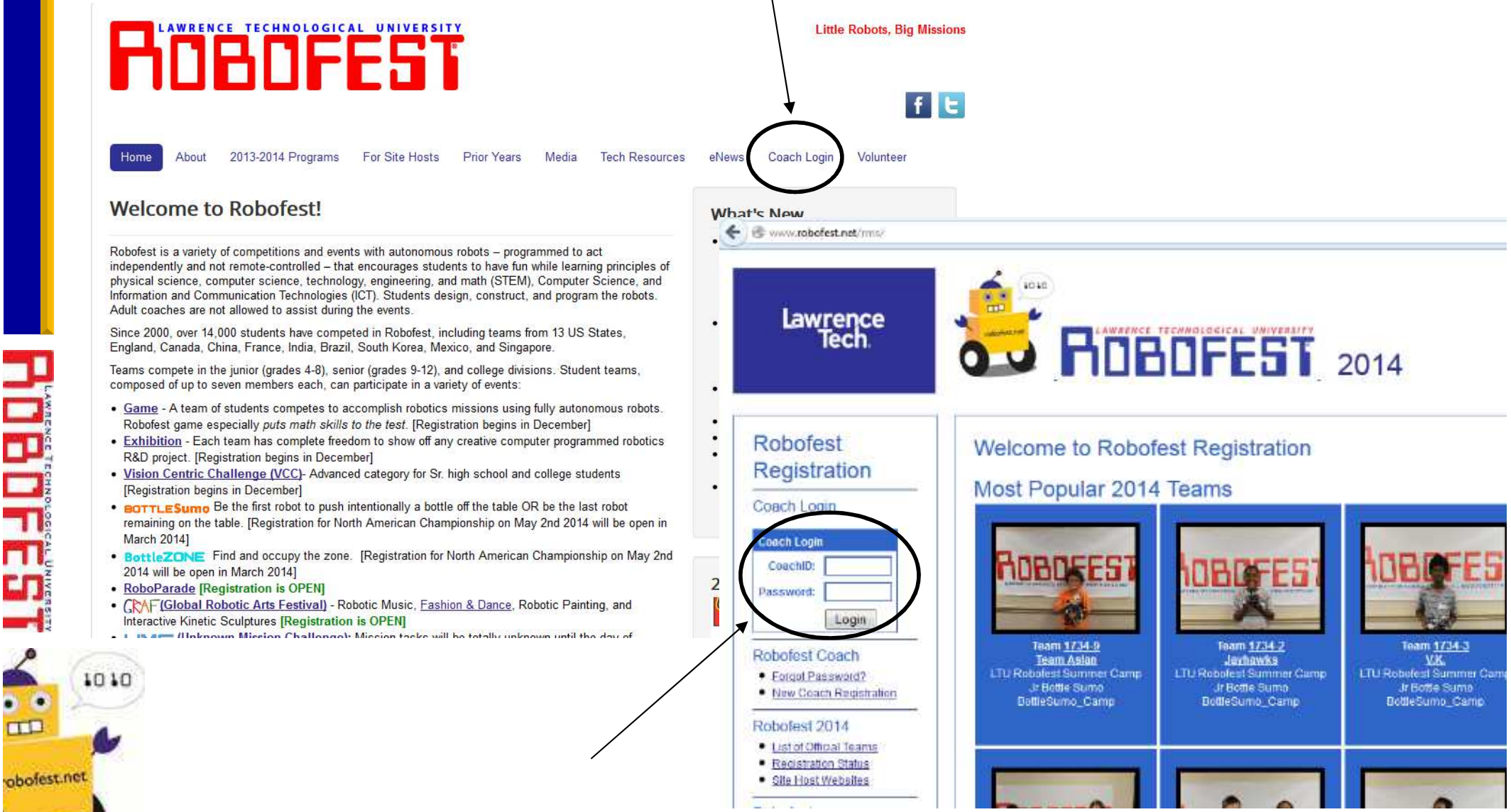
- Coaches must submit the Age Division Waiver Request Form by email or fax, if there is any age exception.
- Robofest will return the form to the coach with approval or disapproval.
- Usually, playing up from Jr to Sr is permitted.

Steps to Register a Team

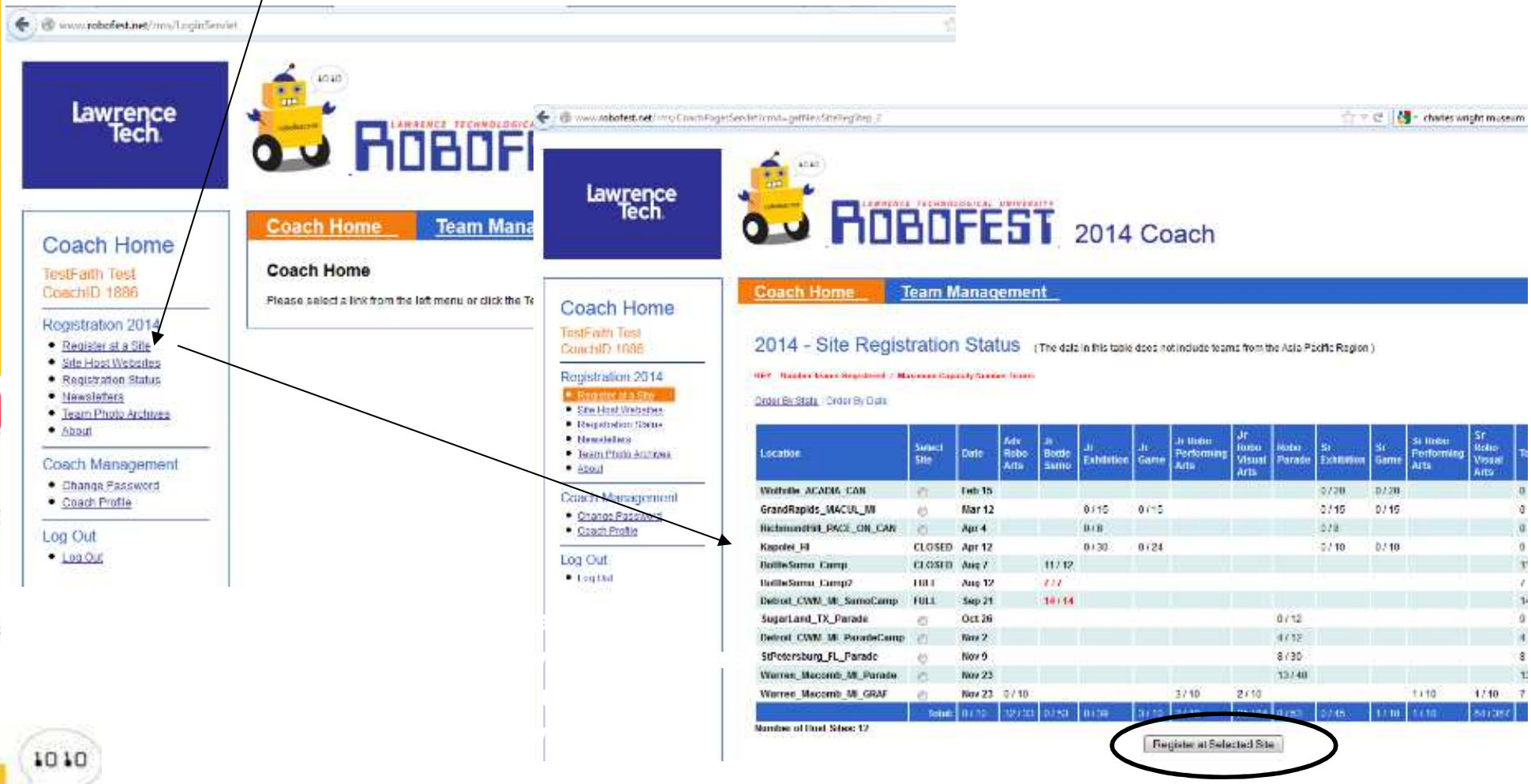
1. Read 2014 rules; ***if you are a returning coach****, go to 4 below.*
2. Go to robofest.net, click on Coach Login, and submit New Coach Registration form
3. Confirm the registration at your email account – If you do not receive a confirmation email, please contact robofestoffice@gmail.com
4. Log on to the coach account at robofest.net
5. Select a competition site and a category per team
6. Register team(s)
7. Pay registration fee online using PayPal (or send a check)
8. Upload team photo; update team info as necessary

You must register as a coach and then log in

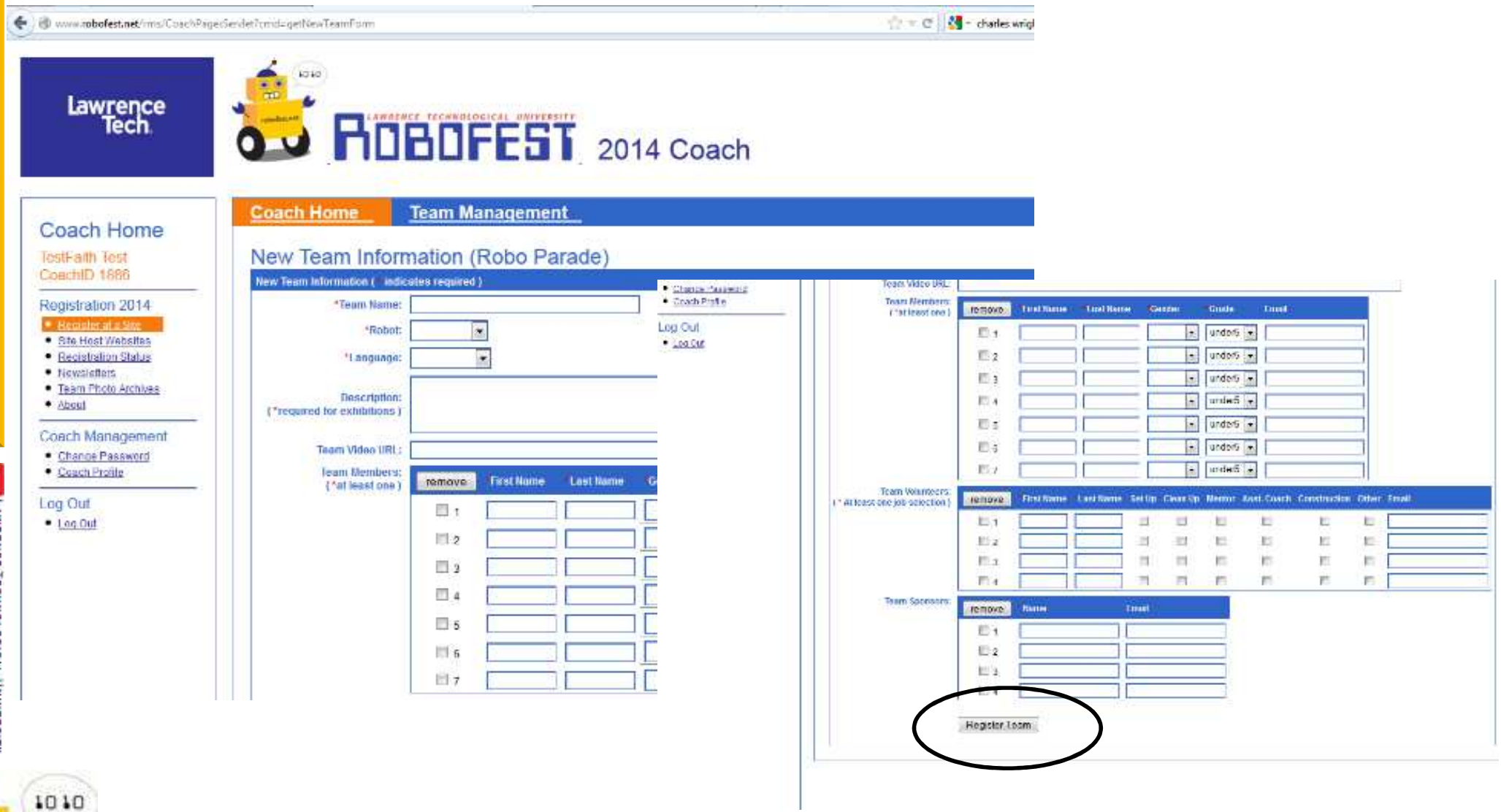
www.robofest.net



Register for the event site of your choice



Enter Team Information



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- **Schedule & Others**
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2014 Main Season Schedule

- Dec 4: Rules announced & posted on the web; Team registration begins
- Early January: finalization of Rules; watch for eNews announcement
- Jan ~ Feb, 2014: Technical workshops, On-site workshops, pre-assessment
- Feb 22: Warm-up at LTU (Judge Training)
- Mar ~ early Apr: Qualifiers, post assessment
- April 11: Video Qualifier deadline
- May 2-3: North American Championship
- May 29-31: World Robofest Championship

Upcoming Events

Date	Time	Event	Location	Instructor
S 1-11-14	10am	Robofest 2014 Kick-off repeated meeting	M218	Faith, CJ
S 1-11-14	1pm-4pm	Workshop NXT-G for NXTs	M218	Joe DeRose
S 1-18-14	9am-12pm 1pm-4pm	Workshop EV3 software for NXTs Workshop EV3 software for EV3s	M218	Joe Derose
S 1-18-14	9am-3pm	Auto Show Parade	COBO	Faith, CJ
S 1-25-14	9am-12pm 1pm-4pm	Workshop EV3 software for NXTs Workshop NXT-G for NXTs	M218	Chris C Maurice
S 2-1-14	9am-12pm 1pm-4pm	Workshop NXT-G for NXTs Workshop NXT-G for NXTs	M218	Fred Maurice
S 2-8-14	9am-12pm 1pm-4pm	Workshop EV3 software for NXTs Workshop EV3 software for EV3s	M218	Chris C Keith B
S 2-15-14	9am-12pm 1pm-4pm	Workshop EV3 software for NXTs Workshop EV3 software for EV3s	M218	Keith B Keith B
S 2-22-14	2pm	Warm up (for Judges)	Gallery	Faith, CJ
S 4-5-14	9am and 1pm	BottleSumo workshop	M213	Kurt M (tent)
S 4-12-14	9am and 1pm	BottleZone workshop	M218	Kurt M (tent)

L2Bot workshops will be added in Feb ~ March

On campus workshops are only for registered and paid teams

AMD Game Field Kits will be available for purchase

- Robofest office M219 in Jan ~ Feb.
  - AMD kits – price TBD
  - Tape Measures - TBD
- robofestoffice@gmail.com

Robofest Office will ship AMD Game kits for each official host site

Things to bring on Competition Day

- Check-in fee (if required by the site host)
- A Robot and laptop/PC for each team
- *Exhibition teams*:
  - Hard copy of programs to give to judges, optional
  - Poster boards to introduce the exhibition description and all the necessary materials for the exhibition
  - Video sharing link
- A power strip and power cord
- Extra batteries or battery charger
- Signed Consent & Release forms

Online Assessment for Math and Science (anonymous)

- Pre-assessment: Instructions will be emailed to coaches in January.
- Post-assessment: After the qualifier, instructions will be emailed to coaches in early April.

- We need control groups (non Robofest students). If interested, please email Faith Kurily, fkurily@ltu.edu

Miscellaneous Info

- PVSA (President's Volunteer Service Awards)

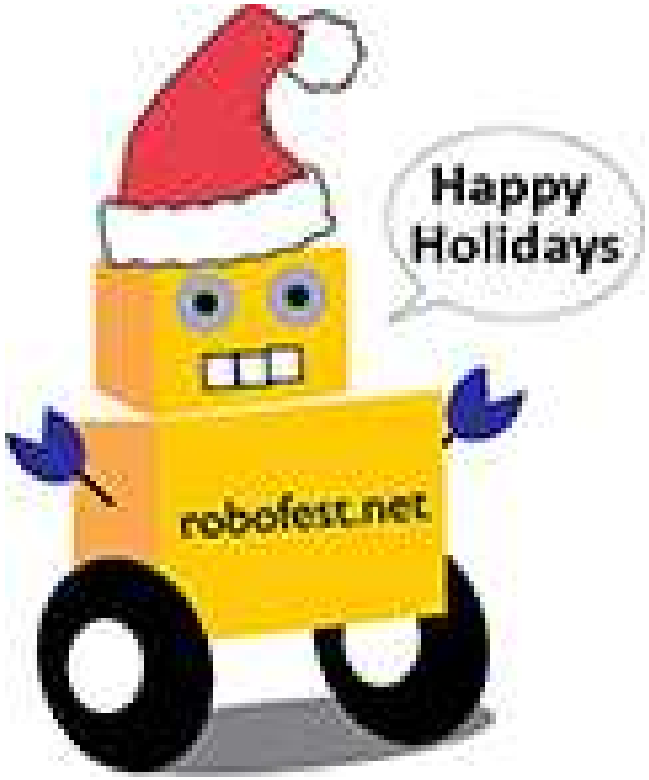
- More Lawrence Tech Scholarships!

Questions?

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

Please join the Robofest eNews list at robofest.net!

Thank you!



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