Article and Photos by Rick Coscarelli - Winning Team photos by LTU's Eric Pope

WRO

September 19, 2015
Southfield, MI

Dive for pearls, find the treasure and climb the mountains!

YEAR TWO - SPECTACULAR!

US Enters its Second Year competing in the World Robot Olympiad!

World Robot Olympiad (WRO) **is a global LEGO Robotics competition** currently consisting of 55 countries with over 23,000 teams. Selected teams from each country will be participating in a world event to be held in Doha, Qatar, on November 6-8, 2015 which will consist of over 400 teams.

Doha is the largest city, principal seaport, economical center and the capital of Quatar, the peninsular Arab country in the Persian Gulf. Doha has a city population of about 400,000 inhabitants, and 613,000, more than 80% of Qatar's population, live within Doha's metropolitan area.

The WRO started in Singapore in 2004 and has grown and added new competing countries each year with the U.S. competition being held for the second time this year at Lawrence Technological University, the Robofest World Headquarters, in Southfield, Michigan. The best teams from each country are invited to attend the World Robot Olympiad each year.

Last year, in 2014, the US placed third in Open Elementary in Sochi, Russia.

AGE GROUPS AND CATEGORIES

The WRO is comprised of five different age groups:

Elementary (Primary) - Participants up to 12 years old

Junior High (Middle) School - 13-15 years old

High (Secondary) School - 16-19 years old

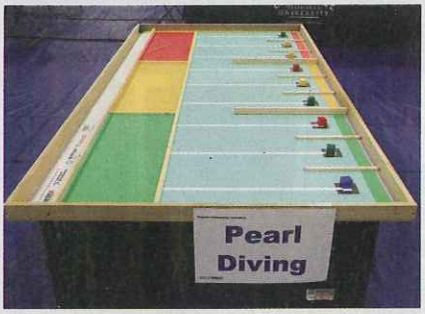
WRO Gen II Football - 10-19 years old

University Category - 17-25 years old

Teams are comprised of two to three members with one coach. A coach can represent two teams. Coaches must be 20 years of age and can only advise the team(s) they represent prior to the competition, with all work being done by the competitors during the competition.

ROBOT EXPLORERS

This year's theme, "Robot Explorers", encourages students to build robots that can investigate and explore different environments, some of them hostile to humans. The following is a brief description of each challenge by category.



REGULAR ELEMENTARY PEARL DIVING

The idea is that the robot will be leaving land to go underwater to discover pearls and bring them back to the surface within 30 seconds, the total air allowed. The total challenge time is only two minutes. There are three zones: green, yellow and red. Within each zone are three Lego cubes of different colors and values. That is, Blue Cube = 0 pearls, Green Cube = 1 pearl, Yellow Cube = 2 pearls, and Red Cube = 3 pearls. Cubes are placed randomly at the start of the competition. The robot is to leave the large colored area, push each colored cube forward into the color zone, determine the value of each cube and then return back to the large colored area (land) and deposit the correct number of ping pong balls which represent pearls.

REGULAR JUNIOR HIGH TREASURE HUNT

The task is to collect five artifacts in an unknown environment while leaving two artifacts untouched which would be harmful if disturbed. The robot will have two minutes to complete the search. The placement of the artifacts is unknown until the start of the run with each artifact and color beneath the artifact providing information to the robot. By reading the color of the artifact and the color of the tile beneath the artifact the robot will be able to move to the next treasure on the playing surface.

REGULAR SENIOR HIGH SCHOOL MOUNTAINEERING

The challenge for the U.S. competition has

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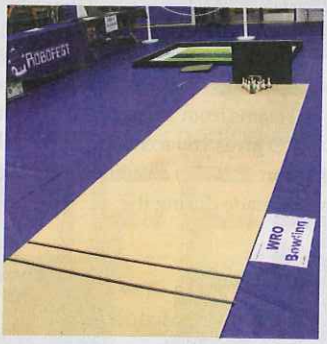
Robo Football (Soccer) at its best!

Dr. CJ Chung, Clous Ditlev Christensen and Ron Revere, looking things over before the start of competition.

been modified such that there are no elevated areas at each corner of the playing surface which represent mountains. All other aspects of the rules apply. However, the competition in Qatar will have the following requirements. Your robot must collect supplies and deliver the supplies to outposts in the mountains, which will be elevated. There will be clues as to the locations and what supplies to collect but you must be cautious that your robot does not fall off the mountain. The idea in the U.S. competition is the same as the World competition in that each colored LEGO block must be taken to its corresponding colored corner less the mountain elevation.

Gotta have FUN!



REGULAR UNIVERSITY BOWLING

The basic premise of this competition is to build a robot that can see a target, aim and hit the target. Your robot must pick up a bowling ball (red snooker ball) and roll it down the lane with the objective of knocking down as many pins as possible and thus scoring the most points. The pins will be placed differently for each of three rounds which are composed of several games.

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GEN II FOOTBALL SOCCER

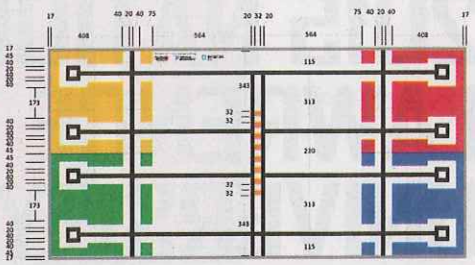
The game is comprised of two ten or two five-minute halves. The ball will be a Hitechnic Infrared Electronic Ball (IRB 1005) with two robots on the field per team. Teams will program their robots to simulate typical football (soccer) play without purposely harming the other team's robots.

OPEN CATEGORY (JUNIOR) ROBOT EXPLORERS

Students are to create an intelligent robotic solution to the theme "Using robots to help humans explore for natural resources in potentially hazardous environments."

A team may only participate in one category.

Regular Elementary



Regular High School

INTERVIEWS AND COMMENTS

Clous Ditlev Christensen, Secretary General of Worldwide WRO indicated his enthusiasm for the U.S. competition and the WRO will continue to work closely with Dr. C. J. Chung to expand the U.S. presence in WRO. Clous brought with him a new member of the WRO, Ron Revere, who has been commissioned to recruit for WRO and to help expand WRO.

ABOVE LEFT: Intensity during build by a young competitor. RIGHT: Team loading ping pong balls (Pearls) prior to the start their run.

Clous offered the following introductory comments to the audience and teams. "It was a long trip but I am very excited to be here. The U.S.A. is one of WRO's priorities and CJ is working hard to keep things on-track. At Qatar you will see 400 teams from 55 countries participating. WRO gives you a chance to learn while having fun. It is also all about the friendships that are made during the competition."

I also spoke with the Dean of the School of Arts and Sciences at LTU, Glen Bauer. Dean Bauer indicated that though he did not get a chance to go to Sochi he knew some of the students and said, "I was on their team and encouraging them from a distance." I asked the Dean what is the awareness on campus of the robotics competitions that are taking place here each year? Dean Bauer indicated, "Well CJ is a legend here on campus whether it is Robofest, Robot Parades or WRO, the campus is 110% behind him. We have many students who volunteer to judge at the competitions. Many students get involved at a young age then when they are here as an LTU student, it is in their blood."

Dr Chung introduced me to Mr. Levi White who has been with Robofest for five years and majored in electrical engineering at LTU. Mr. White is unique in that he is the CEO of a company that produces marshmallow shooters. They have sold more than 10,000 marshmallow shooters to date. This unusual experience and achievement is believed to be the result of Levi's robotic experience and his completion of an electrical engineering degree from LTU. It was suggested that maybe the next Robofest will use marshmallow shooters in the competition.

I asked Dr. Chung, "What do you feel is the biggest difference between WRO last year and this year?" He said, "We have all the competitions here this year. We now have all six categories. The winner of each category will have the ability to compete in Qatar."

Dr. Chung updated me on the US success in Sochi last year. Dr. Chung explained, "Last year in Sochi the US was third in Open Elementary. Malaysia was in first place and Russia came in second." When asked whether there would be more teams participating next year, Dr. Chung replied, "Last year we had 45 teams this year over 80 teams. That's over a 50% increase."

IT IS MORE THAN ROBOTS

I had the opportunity to watch, from a distance, two young elementary competitors and to talk with them about their experience. These young competitors are not just learning how to build and program a robot but rather to understand the problems and joys that life can provide. They are learning what it is going to be like when they are working, in some professional manner, to have things go well and then turn into a disaster. I am talking about the Regular Elementary "Pearl Diving" champions, the RoboGals.

Prior to the competition I was scanning the build area for student competitors who might prove to be an interesting interview. I noticed the RoboGals and indicated to a judge that I was going to interview these two for Robot magazine. The judge suggested that I wait a bit as the two young ladies were having problems with their robot and might need the time to quietly work out their problems. As I continued to watch them I noticed their intensity. I decided to wait until after they competed in their first round to see how they would do and then go for an interview.

LEFT TO RIGHT: Clous Ditlev Christensen Secretary General of World-wide WRO giving introductory remarks prior to the competition. NEXT: Team Q-First Place: Regular Elementary - Pearl Diving - RoboGals. NEXT: Team J- First Place: Regular Junior High - Treasure Hunt - Pi-Rho Technics. NEXT: Team A-First Place: Regular University - Bowling - Robofest. NEXT: Team E-First Place Open Category (Junior) - RoboExplorers. NEXT: Team E-First Place Open Category (Junior) - RoboExplorers.

They came in first place and were exceptionally excited.

It was now an opportune time to go and sit with them and ask them a few questions. Team RoboGals is made up of Jensie Coonradt and Kaiya Hollister from Aurora, Illinois, fifth and fourth-grade students. I asked them how they got involved with robotics. Jensie replied that "Chasewood learning came to our school and I went to their classes, which I really enjoyed." I then asked Kaiya the same question. Kaiya said, "I also went to Chasewood learning classes, which I enjoyed and it was there that I met Jensie and we got matched up. We both spend a lot of time with robotics."

They believed they were ready for the second round of competition and this presented another disaster for them to overcome. Someone had unintentionally handled their robot, causing some damage that was not readily apparent. It resulted in a disastrous next round, in which they in-fact did not complete. From there the girls had to problem solve and get ready for their final rounds, which they did, resulting in them winning the Regular Elementary category. A true-to-life experience of what can happen in a work situation.

WINNING FIRST PLACE TEAMS ELIGIBLE TO ADVANCE TO QATAR

Regular Elementary	RoboGals
Regular Junior	Pi-Rho
Technics	
Regular Senior	Exit 5 Robotics
Open Junior	
RoboExplorers	
Gen II Football	Rockin' Robots
WRO Bowling	Robofest

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LEGO EDUCATION

LEGO Education offers unique solutions to teachers who want to bring more innovation and creativity to their classroom practice. Using LEGO Education tools and hands-on teaching methods, children will learn by experience, collaborate with classmates and think creatively to come up with unique solutions. Find out more at www.legoeducation.com

NEXT: Team C-First Place: Gen II Football (Soccer) - Rockin' Robots. NEXT: Team G- First Place: Regular Senior High School - Mountaineering - Exit 5 Robotics

NATIONAL INSTRUMENTS

Using NI open graphical programming software and modular hardware for testing next-generation gaming systems to creating breakthrough medical devices, NI customers at more than 30,000 companies continuously develop innovative technologies that impact millions of people. http://www.ni.com/

Robot depositing treasure as a part of the Mountaineering challenge. RIGHT: Judges making last minute checks on the field specifications.

TETRIX

TETRIX platforms includes a wide variety of aluminum structural and motion elements, many types and sizes of metal gears, durable and powerful DC and servo motors, and the patented Hard Point Connectors that enables the connection of TETRIX elements to LEGO Technic. http://www.tetrixrobotics.com/

MATRIX ROBOTICS

MATRIX Robotics was created in 2011 by a group of experienced robotics enthusiasts who have spent the past 15 years working and playing with robots. The people at MATRIX set out to design the robotics system they've always wanted and the result was the MATRIX Robotics System; a high quality, affordable, 3D build system. http://matrixrobotics.com

MAERSK OIL

Maersk Oil is a Danish oil and gas company owned by the A. P. Moller-Maersk Group. The company was established in 1962 when Maersk Group. http://www.maerskoil.com

WRO-USA CADILLAC

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Here, we're about "Theory and Practice" – taking abstract ideas into the real world to solve tomorrow's problems. www.ltu.edu

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ROBOFEST

Robofest is a festival of competitions and events with autonomous robots that encourages students to have fun while learning principles of Science, Technology, Engineering, and math (STEM) and Computer Science. Students design, construct, and program the robots. www.robofest.net

4-H LEGO LEGION

4-H is the nation's largest positive youth development and youth mentoring organization, empowering six million young people in the U.S. In partnership with 110 universities, 4-H life changing programs are research-backed & available through 4-H clubs, camps, afterschool & school enrichment programs in every county & parish in the U.S.

WRO PLATFORM REQUIREMENTS

World Robot Olympiad operates with a single platform policy. This means that the WRO only allows the use of the LEGO MINDSTORMS robotics platform for their competitions. The reason behind this policy is to ensure equal opportunities for all participants. ◎

Links

All current participating countries can be found at www.wroboto.org/member-countries
Competition Rules, www.wro2015.org/challenges.php
Oakland Press Article, www.theoaklandpress.com/general-news/20150919/autonomous-robots-compete-at-ltus-national-championships
WRO Sponsor Information, http://wroboto.org/wro2015
WRO - USA Home Page, http://wroboto.us/
WRO US Results Information, http://wroboto.us/index.php/results15
WRO Video Introduction, www.youtube.com/watch?v=4k3JadmfedA&feature=youtu.be
WRO US General Rules, General Rules WRO 2015 (updated March 4)

For more information, please see our source guide on page 65.

HOLIDAY GIFT GUIDE

ROBOT

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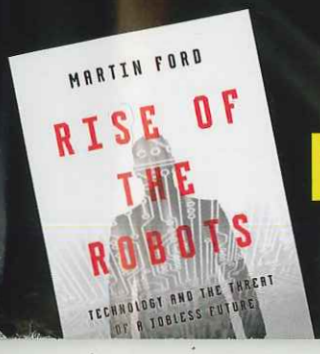
MICHIGAN

INTERNET OF THINGS
& THE CLOUD

WORLD ROBOT OLYMPIAD



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