From our chairman
Johnson Jan looks at how children the world over have fallen in love with the science of robotics

The history of World Robot Olympiad™
From small beginnings to a global competition, children around the world are now thinking, dreaming – and doing

Meet our people
The WRO Advisory Council and the specialists who make World Robot Olympiad happen

Challenges for everyone
With different levels for the different teams, take a look at how everyone finds a place and finds a challenge

Into the Americas
Find out more about a growth area for World Robot Olympiad and the key numbers behind the competition

Two cultures, one competition
Malaysia and Russia are two established areas for WRO with their eyes fixed firmly on podium finishes

Meet our premium and gold sponsors
See how support from LEGO® Education, National Instruments and Maersk Oil helps support WRO

Become a sponsor
Become a sponsor and benefit from working with World Robot Olympiad as well as reaching out to young people

Welcome to Qatar
We travel to Qatar for WRO 2015 to meet the teams and see them face the different robotics challenges

Results of WRO 2015
See the results in all competition categories and age groups at WRO 2015

WRO in numbers
Find out how WRO has grown since the beginning in 2004
From our chairman

Our aim is simple: we want to introduce as many children and young people as we can to the world of robotics. Each model robot they build draws on their design skills, their understanding of different technologies and their ability to master the key scientific principles that lie behind experimentation. We think robotics is a great way to interest a whole new generation in solving the problems of today and tomorrow.

In this annual report you can read about each competition and how they test certain skills and get the teams working and thinking together. You can see how World Robot Olympiad™ is expanding into new countries and meet the sponsors whose support makes the event possible.

And finally, you can read about this year’s final in Doha, WRO 2015, where teams from around the world got together for a festival of robotics, see who was crowned champion and read what the participants thought of the biggest and best tournament yet.

World Robot Olympiad wants you to feel part of our community, so enjoy taking this retrospective look at what we’ve been doing and read about how you can get involved. We’d love you to join us.

Take care,
Johnson Jan

Maria del Mar, 16 years old.
Student of Colegio Científico San Pedro, San Jose, Costa Rica

Why did you decide to participate at WRO 2015?
I didn’t have knowledge of robotics until last year when I started studying at San Pedro School where I took a robotics course. This year my friends and I decided to participate in WRO Costa Rica 2015.

What was your principal motivation for participating at WRO 2015?
I found that I love to build robots and I think it is amazing that my robot can do what I make it do.

What do you take from this experience at WRO 2015?
I have discovered competencies and abilities that I didn’t know I had (programming and building robots) and it has been a great opportunity to develop these skills.

For you, what was the most amazing thing of this Olympiad?
The experience of being part of this competition with many other people makes me feel happy.
Young people are flexible and can think up new ideas. It means they’re naturals for robotics, which is all about experimenting, about building an early version and then making it better. That’s why World Robot Olympiad was started, to bring together young people from across the world and get them working together on exciting robotics activities.

China, Japan, South Korea and Singapore were the first to join in 2004. From humble beginnings WRO has established itself as a leading robotics community each year giving thousands of young people an opportunity to gain their first experiences with robotics and the related disciplines.

In 2015, when the international WRO final travelled to Doha, Qatar, a total of 55 countries participated and the number of teams worldwide reached almost 22,000.

WRO is now a truly global competition with member countries on all continents except Antarctica.

Why did you decide to participate at WRO 2015?
I came here because I thought it was a great opportunity for me to develop my skills on robotics, and also because I want to study something related to robotics like mechanical engineering or structural engineering so I think this is a really great idea.

What is the most important thing that you take from WRO 2015?
The opportunity to be around to other people that like the same things I like. I have learned a lot of robotics, it is a thing that I really, really like. Finally, prepare myself to WRO made me develop abilities like programming because I didn’t know how to do it before this competition and now I know a little bit about it.

Give me a word to describe WRO 2015?
Something incredible!

Esteban Miranda, 17 years old. Student of Colegio Cientifico San Pedro

Team from Belarus constructing their robot before competitions begin
The WRO Advisory Council gathered at WRO 2015 in Doha, Qatar.

The WRO Advisory Council
The AC in 2015 consisted of members from China, Singapore, Malaysia, UAE, Denmark, Japan and Chinese Taipei. The AC decides on all matters of academic importance and choice of host country for the international WRO final. In 2015 the members were:

From left to right:
Dr. Feng-Kuang Chiang, China
Mr. Clarence Sirisena, Singapore
Mr. Kinghui Law, Malaysia
Dr. Najla Muhammed, UAE
Mr. Claus Ditlev Christensen, Denmark
Mr. Kerry Bailey, UAE
Mr. Lars Vahl, Denmark
Mr. Eugene Zhang, China
Dr. Marcello Ang, Singapore
Mr. Yasuhide Kobayashi, Japan
Mr. Johnson Jan, Chinese Taipei

Not in the picture
Dr. Norikane Kanai, Japan
Dr. Han Pang Huang, Chinese Taipei

WRO Games & Rules Review Panel
This panel is headed by Dr. Ole Caprani, Aarhus University in Denmark. Ole is assisted by Mr. Alexander Kolotov from Innopolis University in Russia. They work closely with the host country of each international final to make sure the challenges in all competition categories are thoroughly tested before they are made available to teams around the world.

WRO Judging Panel
This panel is headed by Mr. Brent Hutcheson from Hands on Technology, our South African national organiser. Brent has many years of experience as a teacher and is involved with educational robotics projects in South Africa. Brent works with the host country to ensure we have top level judges for the international WRO final and that the judging principles are constantly up to date.

Meet our people
The WRO Advisory Council and our panels who make World Robot Olympiad™ happen.

Danish minister of Education and Research, Esben Lunde Larsen, visited WRO 2015.
Challenges for everyone

With different levels for the different teams, take a look at how everyone finds a place and finds a challenge.

Regular category

This category has three age groups and aims to test the team’s robotics skills to the limit. Each team must compete in a themed challenge designed by the host country. Previous competitions have involved climbing mountains and fixing faulty solar panels in outer space. The three age groups are elementary, junior high school and high school.

Open category

Also in three age-groups, the Open category is based around a single theme. In 2014 when the international WRO final travelled to Russia, a nation famous for its brave cosmonauts, the theme was space exploration. In 2015, the theme was Robot Explorers which saw projects finding solutions to deep sea exploration and environmentally friendly mining for national resources. The competitors also have to complete a presentation on their chosen solution, meaning that the challenge draws on many different skills. In essence, Open Category resembles a science fair.

Advanced Robotics Challenge - Bowling

Making its debut in 2015 was the exciting new bowling game. Open to students aged between 17 and 25, it sees teams mastering LabView or C programming languages to build a robot that can roll two bowling balls down a bowling lane in under three minutes. Just to add to the complexity and the realism, their robots have to collect each ball before they bowl them, relying on servos, motors, sensors and, of course, the teams’ skills, to locate the position of the pins using vision equipment.

WRO GEN II Football

This game involves two teams with each two robots playing head to head and participants may be between 10 and 19 years of age. The games are intense and chanting spectators are guaranteed! New rules are introduced in 2016 and the category is renamed to WRO Football.
A participant at WRO 2015 from Mexico

From its earliest beginnings in 2004, World Robot Olympiad has had its greatest success in Asia, finding a ready source of young roboteers. But if an event is going to be truly global, it needs to expand into new territories. The Americas are seen as the next challenge for an organisation that believes in spreading the message of robotics – and friendship – all the way around the world.

In the US, many young people already take part in robotics competitions and with a tech savvy populace, the ground has already been prepared. In Mexico, USA and Canada, there are now WRO national organisers who are working hard to grow the competitions.

Secretary General at WRO, Claus Ditlev Christensen, is positive about the future of WRO in North America – but also points out the future looks bright further south: “while WRO remains in a growing phase in the Americas we see the response we’ve had has been incredibly positive. Costa Rica is obviously a strong country for WRO as the country’s government will host the international WRO final in 2017, WRO 2017, but we also have very good operations in Mexico and Panama – and Peru and Bolivia are also on our map. We see a real desire in the Americas to get more involved and to learn more about what we offer.”

The key is adopting a flexible approach in each country instead of a standard program where one size fits all. In the US and Canada, teams already exist and are motivated to seek out new ways of testing their skills. In Costa Rica, our national organizers, Aprender Haciendo, is leading the way together with the country’s government, while in Mexico, WRO has a very good national organisar who are working hard to grow the competitions.

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Success seems to be assured. Teams from the US took part in WRO for the first time in 2014 and finished second in open category at WRO 2014 in Sochi, Russia. The number of teams and member countries across the world has doubled in five years but in the Americas, WRO is growing at an even faster rate. WRO is becoming truly global.

Tannia Fernandez, 17, Costa Rica

Why did you decide to participate at WRO 2015?
I had never been on a robotics course until 2014 when I moved to Colegio Científico San Pedro. In classes I discovered that I love to build robots and to be able to give them faculties.

What do you take from this experience at WRO 2015?
The experience of having participated in a competition that allowed me to gain experience in building robots. And the experience of full collaboration and friendship with my partner because we had to build and to program a good robot that could respond to the competition requirements.

In a few words, how would you describe WRO 2015?
Emotions, nerves... but over all of them, happiness!

Kaiya Hollister and Jensie Coonradt, USA

What is the coolest thing about WRO?
Kaiya: I think that the coolest thing about WRO was seeing all of the different robots and how unique they are and all of the different things that they do like some have arms, some don’t, some have big wheels, some don’t. Like one team has treads for their ping pong dropper so it is really cool to see how unique they are.
Jensie: And it’s really cool to see the different strategies they use to get around the board and it’s really fun to watch.

What do you think you can use this for in your life?
Jensie: Making video games, engineering, making trains, anything that has to do with electronics.

And what do you want to do in life?
Kaiya: Um....I’m going to be a mechanical engineer.
Jensie: And I want to be an engineer too!

Into the Americas

Find out more about a growth area for World Robot Olympiad™ and the key numbers behind the competition

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Two cultures, one competition

Malaysia and Russia are two established areas for World Robot Olympiad™ (WRO) with their eyes fixed firmly on podium finishes

Malaysia – the history of yesterday and technology of tomorrow

Robotics might not be the first thing that people associate with Malaysia, a land of lush wildlife and tall buildings, centuries old history and a bustling international airport. But the country has taken robotics to its heart and, more importantly, the government have made it part of the future.

In September 2014, it was announced that the government wanted to have 60% of college students specialising in science, technology, engineering or mathematics. The Ministry of Education, in cooperation with Sasbadi, the national organizer of WRO in Malaysia, have said that they plan to include robotics on the school curriculum, meaning that WRO is very much on people’s minds.

In 2005, when the country held its first robotics event for young people, over 300 teams took part, quite an achievement for a country of just over 30 million. Now, with official backing, there are just under 3000 active teams trying to see who will win the coveted gold medals and go on to the finals of WRO.

Malaysia sees robotics as the opportunity to turn study into a practical activity that produces three dimensional, working models. With the country and its education system all behind it, expect to see Malaysia adding to the staggering total of 2012, when they won 12 of 21 awards. In the words of one official, ‘WRO is helping to shape Malaysia’s tomorrow for the better’.

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Russia – meet the Russian robots building the future

Russia has taken World Robot Olympiad to its heart. From the earliest days, teams came and competed in the various challenges, but now things are getting into a higher gear. Innopolis University, a brand new university in the new city of Innopolis in Tatarstan, at the heart of the Russian Federation, has been given the task of acting as national organizer.

A sign that the decision to place Innopolis in charge has acted as a catalyst came in 2014. The national final travelled to Kazan, capital of Tatarstan, marking the first time the event has been held outside Moscow. It was so successful that in 2015, the first year in Innopolis, Russian Prime Minister Dmitry Medvedev visited and helped them celebrate its arrival.

Teams from 45 of Russia’s 89 constituent parts took part in the final, often travelling great distances to enjoy the new city, and benefit from the experts in educational robotics who have flocked to the university.

The university’s role doesn’t end there. They also train judges and help appoint the regional representatives whose job is to promote the event and recruit more teams.

With a special boot camp for children who are not yet ready to take part in the full Olympiad, both Innopolis and Russia are helping to bring robotics to young people who have never before seen themselves as future engineers. Expect to see more young, Innopolis-trained roboteers mounting the winner’s podium in the future.
Russian team “Robofriends” and coach, Sergey Fillipov, receiving the LEGO® Education Creativity Award from Pernille France.

LEGO Education

The key component to all of the teams’ robots is the LEGO® MINDSTORMS® Education EV3 set. Designed to provide an accessible and immediate way for children and young people to experience the challenges and rewards of robotics, it encourages team members to collaborate and think creatively to overcome practical problems.

For that reason, LEGO Education was the natural choice as a sponsor. They recognise that people learn best when immersed in a real and engaging environment where their solutions have real-world payoffs. And that is what World Robot Olympiad believes too. The partnership between us has helped to bring together children from all over the world, many of whom may only have seen robots in their textbooks.

Meet our premium and gold sponsors

See how support from LEGO Education, National Instruments and Maersk Oil helps support WRO

National Instruments

National Instruments is a technology company built by and run by engineers. As a company that works with engineers in virtually every industry, NI is uniquely positioned to help inspire and prepare the next generation of innovators.

By contributing technology, their employees’ time and financial resources, NI helps make each year’s competition happen. NI believes that the best way for students to learn science and engineering skills is through hands-on learning using real-world industry tools. This makes the partnership between NI and WRO a natural fit.

National Instruments says that if you can turn it on, connect it, drive it or launch it, their technology is involved somewhere, and that is the spirit we want our young roboteers to embody, too.

Pernille France is the Senior Director of Global Marketing Solutions for LEGO Education

How well does WRO sit with LEGO values?

Perfectly. LEGO and in particular LEGO Education are about engaging creative learners in real life problems. The idea of a learning agenda based on creativity, problem solving, critical thinking and collaboration is key for us and for WRO.

How does WRO build an interest in the ‘STEM’ subjects?

You need subject specific skills to solve the challenges and it helps to see how interconnected those subjects are. Students see that they’re relevant and that helps motivate them and might even shape their career choices.

Why should people become sponsors?

This is easy. Children are everyone’s future and companies have a natural interest in students who are able to solve future challenges for them. We need new ways of thinking and of seeing problems and this is the ideal event to develop that, inspiring and developing the builders of tomorrow.
Ray Hsu is the Section Manager of Academic Programmes at National Instruments.

What made you think about being a sponsor? NI and WRO share a common vision. We believe the best way to inspire today’s students to become tomorrow’s scientists is through hands-on experiences using real-world tools. The WRO does just that!

How do you get involved? We’ve been a partner and sponsor of WRO for about five years. Several of our branches participate in WRO competitions and work closely with university teams. And of course, we sponsor the annual Championship each year and send several NI representatives to the event.

Do you benefit? We contribute technology, time and financial support. In return, we’ve been able to integrate our technology with WRO and know that we’ve inspired thousands of students in science, technology, engineering and mathematics.

What would be your advice to potential sponsors? If you want to work with a new generation of innovators, this is where you want to be. Companies that are passionate about education and have an interest in supporting an organisation that positively impacts thousands of students around the world should absolutely support WRO.

World Robot Olympiad brings together thousands of children and their adult helpers. They are all interested in, and excited by, the fast-developing world of robotics as well as the science and technology that help drive it forward. This creates a unique opportunity for you and your business.

Help us achieve our goals of reaching out to more children around the world and hosting the climactic final event, and you have access to all these people, and a lot more. Your brand will be seen across the globe, linked with the idea of educating the next generation and transforming human possibility, while your logo will be alongside those of companies seen as innovators and thought leaders in their respective fields.

To talk about sponsoring the competition and how you can get involved with the next generation of technology-hungry robotics geniuses, let us know about your interest and we will do our best to bring knowledge of your support to our community.

Become a sponsor

Become a sponsor and benefit from working with World Robot Olympiad™ as well as reaching out to young people.
Venue for WRO 2015, the Al Shaqab Equestrian Arena in Doha, Qatar
The host country for the international WRO final changes each year, and in 2015 the competition was held in Doha, Qatar. Over 2,000 participants, coaches, judges and accompanying delegations flew into Doha to participate in WRO 2015.

Doha is the perfect venue for World Robot Olympiad™. Centrally located with an international airport boasting direct flights to over 150 cities. The competitors, coaches and judges flew in from over 50 countries, and were quickly bussed to hotels around this most vibrant of cities before being spirited off to the opening ceremony on Friday night. After that, it was back to the hotels to check that the robots survived the journey and early to bed for a nine am start back at the arena. Events all took place at the Al Shaqab Equestrian Facility, a soaring expanse of steel and glass arranged into a distinctive horseshoe that normally acts as home to some of the world’s finest horses. For these three days in November, however, it played host to thoroughbreds of a different kind, as the teams carried in their robots, designed rather than bred over many months to solve a set of complex robotics challenges.

Exactly what the robots’ challenge was depended on the category they had been entered into. They change each year to keep teams on their toes and the organizers also make last minute changes to test the robot owners’ ability to improvise and think on their feet. This year saw them finding ways to dive for pearls, go mountaineering or hunt for treasures, play football or even, in this year’s debut event, go bowling.

The hall was lined with the tables with the colour-coded mats on them which the teams had been working with for the previous months to solve a set of complex robotics challenges. From the moment each session starts, they’re wholly on their own.

It made for a tense atmosphere in the hall, but every WRO event is also a chance to meet people from countries you may only have seen on a map. In a few hours, when teams had found their feet and started to compete with each other, there were soon conversations taking place in many different languages and new friendships being made.

An exhibition area inside the arena was built up to look like an old Souq, or traditional market. Within the souq, robot experts from around the world showed off their inventions and engaged with the participants and the public. The LEGO Experts are adult teachers, engineers and roboticists from around the world that push the LEGO® MINDSTORMSTM robotics systems to their limits.

The first day ended with the traditional friendship dinner at which many of these friendships were cemented, as well as lectures and robotics master-classes from experts in the field. For the teams who would progress no further, it marked the end of an exciting day, full of colour, life and, of course, robots, but for the others, it was on to the final day’s competition.

Back in the hall the following day, numbers might have thinned out, but the tension increased as teams closed in on their final prize. By 12 o’clock, the finals were over, and the most imaginative, the fastest and the millimetre-precise were all crowned as winners. The point, though, is not who wins, but who learns the most by taking part and the friendships that were made along the way.

WRO 2015 came to an end with the awards and the closing ceremony, but for many of the robot owners, it didn’t end at all. The lessons learned and the friendships made will stretch into the future and many of these competitors will see each other at future events or work together on robotics challenges of the future.
### Results of WRO 2015

#### Regular Elementary
1. Storm Divers, India
2. Thunder Divers, India
3. Taiwan Legend, Chinese Taipei
4. SKBU TEAM A, Malaysia
5. PANYA ROBOT, Thailand
6. Cardi-LEGO, Canada
7. AURUM, Russia
8. RoboMind M&M, Thailand
9. Smartkids Enhancement Team, Philippines

#### Regular Junior High
1. TAIWAN YES, Chinese Taipei
2. robotics X, Japan
3. Ninja, Japan
4. The Last Stand, Chinese Taipei
5. Taiwan Yunlin Last Hope, Chinese Taipei
6. SaSu Spire, Singapore
7. RPBOT_EJ2, Thailand
8. RoBo, Israel
9. RoboBoys1, Qatar
10. X-Machine, Canada

#### Regular High School
1. TAIWAN YES, Chinese Taipei
2. robotics X, Japan
3. Ninja, Japan
4. The Last Stand, Chinese Taipei
5. Taiwan Yunlin Last Hope, Chinese Taipei
6. Satu Spire, Singapore
7. RPBOT_EJ2, Thailand
8. RoBo, Israel
9. RoboBoys1, Qatar
10. X-Machine, Canada

#### Open Elementary
1. YC EXPLORER RANGER, Malaysia
2. Robofriends, Russia
3. THE FISHERMEN’S FRIEND, Malaysia
4. SIROUX, South Korea
5. STARBOT, Malaysia
6. Headcrabs, Russia
7. A Space Odyssey, Russia
8. RoboBots, Russia
9. Takshila Ambur, India
10. SG Junior Team 1, Thailand

#### Open Junior High
1. ROBOTISTS, Malaysia
2. Shadow Bots, India
3. Scholabotics, Germany
4. UAE15, UAE
5. Persian Genius, Iran
6. Unknown Team, Qatar
7. Otemon Space Challenger, Japan
8. Path Finders, India
9. EUR, Russia
10. UAE14, UAE

#### Open High School
1. BURITOS, Russia
2. Power, Chinese Taipei
3. SILENT PRODIGIES, Malaysia
4. Dacil Schwertl, Germany
5. SHON ATOM, China
6. TOP BISANG, South Korea
7. MBAW Horses, Qatar
8. SHERPA, South Korea
9. MagmaBot, Costa Rica
10. TEAM CHK01, Malaysia

#### Advanced Robotics Challenge
1. NCTU Robotics, Chinese Taipei
2. PMBL, Russia
3. AVRCC, Chinese Taipei
4. INA-TECHNO02, Costa Rica
5. LEGO Master, Hong Kong
6. Unecibots, Peru
7. Beijing Normal University, China
8. Robofest, USA
9. YOUR ROBOT ESPRIT, Tunisia
10. Teikyo ROBO Lab, Japan

#### WRO GEN II Football
1. ARAMAITEE FC, Malaysia
2. RoboSpecialists, Greece
3. DBS, Hong Kong
4. Hexagon, Russia
5. Labyrinthos, Chinese Taipei
6. FS Restart, Chinese Taipei
7. 5A6T TIGERS, Malaysia
8. STJ BEEs, Malaysia
9. TW BUBBLE TEA, Chinese Taipei
10. Lapu-Lapu Robotics Team B, Philippines
WRO in numbers
An overview of numbers of teams across age groups and categories in 2015

- Regular Category Elementary: 6029
- Regular Category Junior High School: 6019
- Regular Category High School: 408
- Open Category Elementary: 1110
- Open Category Junior High School: 1290
- Open Category High School: 1063
- WRO Football: 1571
- Advanced Robotic Challenge: 280

Total: 21514

This graph shows the growth of participants and the numbers of participants according to number of countries.

Livescores at WRO 2015
See you in India in 2016

WRO sponsors in 2016

Premium sponsor

Silver sponsors

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