

	<b>F.I.R.S.T</b>	<b>Robocup</b>	<b>RoboFest</b>	<b>W.R.O.</b>	<b>VEX Robotics</b>
History	1992	1997 : Robocup 2000 : RobocupJunior	2000	2004	2007
Main Organizer	FIRST   For Inspiration and Recognition of Science and Technology <a href="https://www.firstinspires.org">https://www.firstinspires.org</a>	Robocup Federation - <a href="http://www.robocup.org">www.robocup.org</a> <a href="http://www.robocupjunior.org">www.robocupjunior.org</a>	Lawrence Technological Univeristy - <a href="http://www.ltu.edu">www.ltu.edu</a>	World Robot Olympiad Committee - <a href="https://wro-association.org">https://wro-association.org</a>	Robotics Education and Competition Foundation - <a href="https://www.vexrobotics.com/">https://www.vexrobotics.com/</a>
Regionals	Local, regional, national, and world competitions	National, and World competitions	National, and World competitions	Regional, National, and world competitions	Regional, National, and world competitions
Popularity in USA	Highest	Low	Low	Low	Somewhat, but Argumentative highest as well. (in April of 2018 was named the largest robotics competition in the world by
Grades / Ages / Leagues	JrFLL - Gr. K to 4 FLL - Gr. 4 to 8 FTC - Gr. 7-12 FRC - Gr. 9-12	Regional: Age 9-18. International: Age 12+ Major Leagues: College and Research Level . Junior Leagues : Soccer - Light-weight and Heavy-weight) Rescue Maze Rescue Line Robot On-Stage	Junior - Gr. 5 to 8. Senior - Gr. 9 to 12 Collegiate - only for Vision Centric Challenge.	Beginner - 6 to 10 Elementary - up to 12. Junior - 13 to 15 Senior - 16 to 19 FootBall - 10 to 19 Advanced level: 17-25 years old	VEX IQ - Gr. 4 to 8. VEX EDR - Gr. 7 to 12. VEX U - College level
Awards	over 20+ awards, depending on the division. They are trying to maximize the chance that every team get	about 6 -10 awards for each league	unclear.	from 25 to 35 awards, depending on the division	from 25 to 35 awards, depending on the division
Venue for World Event	within USA : - Houston, TX - Detroit, MI	Any country	Any country. Mostly in Asia.	Any country.	Louisville Kentucky since April 2014

Atmo- sphere	Sport like. Mentors,and teams are closely working together during competition	very Subdue. ONLY team members are allowed in work pit area. Mentors are not allowed to communicate with team members during competition.	unclear..	unclear..	Sport like. Mentors,and teams are closely working together during competition
Duration	locals: 1 day event world event: 3 days	locals: 1 day event world event: 4 days 5th day is for Technical Symposium where researchers from globe will give presentation and talk.	unclear..	unclear..	unclear..
Team size	JrFLL - 2 to 6 FLL - 2 to 10 FTC - 2 to 15 FRC - 6 to 100	all (pre-college) : 2 to 4 or 5 depending on the league. For College: Various	1 for the individual game category. But 2 to 7 for others.	unclear.	no known restriction, but usually 3 to 4 for lower level game. Have seen over 10.
Season Schedule	Regionals vary from October through April. World event: last week of	National: Early Spring. World : Early Summer.	Regional : Dec World : May	Regionals : year-round World : Usually in Late Fall.	Regionals : year-round World : Usually in April
Parti- cipation in World Level	approx. 600 teams from about 30 nations (including all leagues)	over 500 teams from about 50 nations. (including all major leagues)	unclear..	unclear..	over 1000 teams from 30+ nations. (including all leagues)
Cost	Considerably higher due to investment in new arena, and mechanical requirement. it can be very costly in materials and time in order to adapt new rules. The registration cost is also	Low-cost and affordable competition. Field is 100% or mostly reusable year after year.	Low-cost and affordable competition. Field is 100% or mostly reusable year after year.	Higher, but less expensive than FIRST game.	Expensive. Comparable to FIRST game.

Any unique feature different from others	<p>Consist of various types of games based on the grade levels.</p> <p>JrFLL and FLL : Require scientific research.</p> <p>FTC and FRC: "Heavily" in mechanical design.</p> <p>Team work simulates how a corporation work - from marketing to deployment.</p>	<p>Every league "Heavily" focusing on software algorithms gearing toward AI development.</p> <p>Electronic design can be very demanding especially in Soccer.</p> <p>Highly encourage teams to design their own hardware from scratch.</p>	Consist of various types of games based on the grade levels.	Consist of various types of games based on the grade levels.	Consist of various types of games based on the grade levels.
Controller & other electronic	From a standard kit Must use a single proprietary Hardware/Software platform	Any	Any	Must be from VEX	Must be from VEX
Requirement on hardware	<p>Proprietary</p> <p>Very different requirement on the Mechanical requirement from year to</p>	<p>Can use any hardware.</p> <p>Continuous improvement in the mechanical requirement from year to year.</p>	<p>Continuous improvement in the mechanical requirement from year to year.</p>	<p>Proprietary</p> <p>Very different requirement on the Mechanical requirement from year to</p>	<p>Proprietary</p> <p>Very different requirement on the Mechanical requirement from year to</p>
	Heavily in Mechanical.	Heavily in software automation. Can be Mechanical and Electronic	Heavily in software automation. Can be Mechanical and Electronic	Like FIRST, but has extended automation.	Like FIRST, but has extended automation.
Software Algorithms	It provide clear sample to follow in order to encourage students to run the robot in Auto mode.	Heavily emphasize on algorithms improvement year after year. In order to perform well in the games, students need to know college level data structure, algorithms, and computer	Heavily in software automation.	Heavily in software automation.	Allow to run either tele-op or auto mode.
	Can be very challenging, but more attainable by novice in simpler level.	Very challenging. Less attainable by novice.	Can be very challenging, but at least more attainable by novice in simpler level.	Can be very challenging, but at least more attainable by novice in simpler level.	Can be very challenging, but at least more attainable by novice in simpler level.

Time limit in Game	Total 2.5 minutes. - 15 seconds for Auto mode. - 2 min + 15 sec for Teleop mode (i.e. Human control)	varies from 2 to 15 minutes. Completely Auto mode.	Large varieties	unclear.	Total 2 minutes. - 45 seconds for Auto mode. (only for EDR and VEX U) - 1 min + 15 sec for Teleop mode (i.e. Human control)
Consist of secret	no	yes in world event	yes in both regional and world event	yes in world event	yes in world event
Self-designed	no	yes (OnStage)	no	no	no
Field Challenge	Static Field. For the lower level - Mostly based on dead-reckoning method.	Dynamic Field Completely based on robot's self-awareness. Plain looking field.	same as RCJ	depends on the game. But mostly colorful.	depends on the game. But mostly colorful.
Game Theme	Robot Game & Project change every year.	Theme remains mostly the similar from year to year.	Game - Junior & Senior (Regulatory changes every year) Exhibition - Junior & Senior (Free Theme in Mathematics and Science subjects) Advanced Vision Centric Robot Challenge	Theme changes every year	Theme changes every year

## Computer Science Exams and Competitions

USACO	<a href="http://www.usaco.org">www.usaco.org</a>	USA Computing Olympiad holds around four training exams per year and top finishing students are invited to further improve their skills at a summer camp, and may participate in the world Olympiad.		
American Computer Science League	<a href="http://www.acsl.org/">http://www.acsl.org/</a>	Contests are available for students in elementary school through high school.		
Hackathons	<a href="https://www.hackalist.org/">https://www.hackalist.org/</a>	A hackathon is a great way to improve your computer skills through competition and collaborative computer programming. While many hackathons are traditionally meant for college students, there are likely local events near you that will allow high schoolers to attend.		
Google Code-In	<a href="https://codein.withgoogle.com/about/">https://codein.withgoogle.com/about/</a>	Open for students ages 13-17, this contest is great for individuals beginners to computer science. The competition is designed to introduce students to open source software development.		

**What we choose :**

Robotics	RobocupJunior ZeroRobotics	(based on: Distance,A.I. Focus, Affordability, Sustainability, students' own work)
Computer	USACO	

**General Criteria for entering competitions :**

For 1st time participants to RCJ:

- 1 For 1st time participants, they must perform well in Robotics Projects Track - I & II - Analytics and recommended by instructors in order to enter competition group.
- 2 Demonstrate the maturity of applying himself/herself. The student needs to have the maturity to stay on task without adult supervision for minimum 2 hours. If an individual constantly requires adult supervision and not mature enough to assert his/her own analysis, he/she will not be a good candidate.
- 3 Must demonstrate the willingness to make commitment. This means one must demonstrate this capacity throughout his/her meetings at SR.
- 3 Should not participate in another demanding robotic competition within the same season.
- 4 Passion to learn and challenge in this subject matter, not because of external influence.
- 5 The child should have the right temperament, willingness to work with others. Such as dealing with disagreement, handling mistakes, etc. If the child tends to be very abrasive and be over-bossy, he/she will not be a good candidate.
- 6 Love robotic programming and/or building.
- 7 Must demonstrate the willingness to make commitment. This means one must demonstrate this capacity throughout his/her meetings at SR.

[Also see our Criteria table](#)