ANNUAL REPORT
2018-2019

Robotics Education & Competition Foundation
Inspiring students, one robot at a time.
Welcome Message
The REC Foundation believes that robotics and STEM are for everyone, and strives toward an inclusive robotics community that is reflective of the diverse world we live in, and the one we want to leave behind.

Impact of Participation in Robotics
Direct feedback from educators, and students express interest in pursuing STEM careers after participating in Competitions.

Our Programs
Events, Competition and programs available at the REC Foundation

Girl Powered Program
Providing tools for success, and enabling comfortable environments where all students’ confidence and abilities can flourish

Financial Highlights
Multi-year comparison of operating and business metrics of the REC Foundation

Board of Directors
Keeping a sustainable future by adopting sound, ethical, and legal governance, financial management policies and mission

Sponsors and Volunteers
With the help of our sponsors and volunteers we can continue to fulfill our mission of supporting teachers/students in the future of STEM education and robotics
On behalf of the Robotics Education & Competition (REC) Foundation, I am grateful to our growing community and for your encouragement and support of our work to engage students in hands-on, affordable, and sustainable robotics engineering programs. During the 2018-19 season, 24,000 competitive robotics teams from 60 countries participated in 2,300 events where they gained valuable STEM skills, communication skills, and developed lasting mentorships and friendships to enhance their futures. As a result of our collective effort, 94 percent of teams report their intent to return to competitive robotics next season.

The REC Foundation believes that robotics and STEM are for everyone, and strives toward an inclusive robotics community that is reflective of the diverse world we live in, and the one we want to leave behind. Our dynamic Girl Powered initiative includes team grants, workshops, Online Challenges, and support materials. Female participation in our programs continues to rise from 23% in 2016 to nearly 40% in 2018. In March 2019, we hosted the first-ever student robotics tournament in the Southeast region of the U.S. with robotics teams composed of all Deaf and Hearing Impaired students in partnership with the NTID Regional STEM Center (NRSC) at the North Carolina School for the Deaf. We look forward to increased engagement in our programs in additional areas of focus to provide equitable access to our programs for everyone.

With plans in the near future to launch an aerial drones competition, a manufacturing program and competition, and even more exciting programs and competitions made available through our partnerships and sponsors, I am excited for the year ahead.

As we celebrate our achievements, we strive to increase transparency and engage our supporters in our work. I invite you to review the REC Foundation Annual Report for the 2018-19 fiscal year. I am truly thankful for each of our teams, coaches, Event Partners, volunteers, staff, partners and sponsors for their continued commitment to advancing students in robotics and STEM.

DAN MANTZ
CEO & Chairman of the Board
Engaging in competitive robotics not only invites students to explore the fundamentals of STEM, but encourages important life skills like teamwork, communication, and collaboration. Even more compelling is the direct feedback from educators, who report that 9 out of 10 students express interest in pursuing STEM careers after participating in the VEX Robotics Competition.

**WHAT DOES THE S&E JOB MARKET LOOK LIKE FOR U.S. GRADUATES?**

The U.S. Bureau of Labor Statistics projects that, during the period 2010–2020, employment in science and engineering occupations will grow by 18.7%, compared to 14.3% for all occupations. This is promising news and an even more compelling call to action to redouble our efforts to provide students with hands-on, fun, and challenging robotics engineering opportunities.

Source: www.nsf.gov/nsb/sei/edTool/data/workforce-03.html

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A higher percentage of girls (96.2%) than boys (91.8%) said VRC participation made them want to learn more about robotics, and a higher percentage of girls (78.5%) than boys (74.9%) said VRC made them more interested in taking additional math or science classes in high school and college.

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Students reported they were interested in taking additional Math or science classes in high school or college.

Students said they wanted to learn more about robotics (92%), engineering (90%), and computer programming (89%) because of participation in VEX Robotics Competition.

Student were interested in taking engineering courses in college.

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Sources: www.asee.org/public/conferences/8/papers/2994/download
wwwroboticseducation.org/documents/2019/08/study-vex-robotics-competition-evaluation.pdf

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75% of students reported they were interested in taking additional Math or science classes in high school or college.

87% of students reported they were more interested in having a job in a STEM or computer field.

83% of students were interested in taking engineering courses in college.
**OUR PROGRAMS**

**O N E  E V E N T - T H R E E  C O M P E T I T I O N S**

**GAME CHALLENGE MATCHES**

Multiple robots compete with other robots to score as many points as possible.

**DRIVING SKILLS CHALLENGE**

One robot take the field to score as many points as possible entirely through human interaction.

**PROGRAMMING SKILLS CHALLENGE**

One robot take the field to score as many points as possible during an autonomous round with limited human interaction.

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**OUR PROGRAMS COMPETITION OPTIONS**

<table>
<thead>
<tr>
<th>Aerial Drones Competition</th>
<th>Online Challenges</th>
<th>VEX IQ Challenge</th>
<th>VEX Robotics Competition</th>
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</tr>
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<tbody>
<tr>
<td>Middle &amp; High School</td>
<td>Elementary School through University</td>
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<tr>
<td>In-person and virtual competition-based experiences</td>
<td>Students are the World participate in engineering competitions online</td>
<td>Computer programming included</td>
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<td>Gain desired industry skills, i.e. programming, CAD, and technical writing</td>
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<tr>
<td>After school or weekend events</td>
<td>Offered in variety of STEM subjects</td>
<td>Teamwork matches</td>
<td>Driver controlled &amp; autonomous</td>
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<td>Students can win a chance to compete at the World Championship</td>
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“TESLA wants students to experience competitive robotics because so often we hear specifically from employees that competitive robotics was that inflection point that made me want to go into engineering. It is critical that students start robotics at a young age, and more importantly, that the community engages each student before stereotypes take hold.”

- Chris Reilly WorkForce Dev. & Education Lead, TESLA

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- Chris Reilly WorkForce Dev. & Education Lead, TESLA
The Robotics Education and Competition (REC) Foundation and VEX Robotics are working to make robotics reflective of the diverse world we live in, and the one we want to leave behind.

We’re committed to showing how exciting it is to be involved with STEM, showcasing examples of how women are changing the world, providing tools for success, and enabling comfortable environments where all students’ confidence and abilities can flourish.

Girl Powered means supporting all your teammates, classmates, friends and family to try new things and reach outside their comfort zone. Being Girl Powered means finding people who you don’t see in robotics, getting them to try it, and making them feel like they belong. It is about encouraging others, both girls, and boys, to actively embrace a more diverse culture. We want to encourage new experiences, a diverse culture, and a more encompassing definition of what a roboticist looks like.

Together, let’s redefine the face of STEM.

Prior work suggests that children who are exposed to STEM curriculum at an early age demonstrate fewer gender-based stereotypes regarding STEM careers and fewer obstacles entering these fields down the road.

(Literature Review: The Gender Gap in STEM Fields, DevTech Research Group, Tufts University, December 2017)

While women receive over half of the degrees in the biological sciences, they receive far fewer in computer science, engineering, physical science and mathematics.

FINANCIAL HIGHLIGHTS

Revenue and Support:

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Program Services</th>
<th>General Operating Expenses</th>
<th>Fundraising</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributions and Grants</td>
<td>$8,639,832.00</td>
<td>$8,639,832.00</td>
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<tr>
<td>Event Income</td>
<td>$4,935,500.00</td>
<td>$4,935,500.00</td>
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<tr>
<td>Total Revenue and Support</td>
<td>$13,575,332.00</td>
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</tbody>
</table>

Expenses:

<table>
<thead>
<tr>
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<th>Total</th>
<th>Program Services</th>
<th>General Operating Expenses</th>
<th>Fundraising</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensation and Benefits</td>
<td>$3,524,095.00</td>
<td>$2,694,945.00</td>
<td>$587,650.00</td>
<td>$241,500.00</td>
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<tr>
<td>Advertising and Promotion</td>
<td>$285,339.00</td>
<td>$171,204.00</td>
<td>$ -</td>
<td>$114,135.00</td>
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<tr>
<td>Office Expense</td>
<td>$454,033.00</td>
<td>$404,089.00</td>
<td>$49,944.00</td>
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<tr>
<td>Occupancy</td>
<td>$108,501.00</td>
<td>$96,566.00</td>
<td>$11,935.00</td>
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<tr>
<td>Travel</td>
<td>$1,117,066.00</td>
<td>$1,061,204.00</td>
<td>$33,512.00</td>
<td>$22,350.00</td>
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<tr>
<td>Depreciation</td>
<td>$6,321.00</td>
<td>$6,321.00</td>
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<tr>
<td>Insurance</td>
<td>$6,655.00</td>
<td>$5,923.00</td>
<td>$732.00</td>
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<tr>
<td>Event Expenses</td>
<td>$6,939,584.00</td>
<td>$6,939,584.00</td>
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<tr>
<td>Other Expenses</td>
<td>$77,771.00</td>
<td>$77,771.00</td>
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<tr>
<td>Total Expenses</td>
<td>$12,519,365.00</td>
<td>$11,457,607.00</td>
<td>$683,773.00</td>
<td>$377,985.00</td>
</tr>
</tbody>
</table>

The REC Foundation’s suite of VEX Competition programs engage students in elementary school through college with:

- Over 60 countries
- 24,000 teams
- 240,000 students reached
### Meet Our Board of Directors

**DAN MANTZ**  
CEO  
Chairman of the Board  
REC Foundation  
Dan acts as a direct liaison between the REC Foundation and the Board. Prior to joining the REC Foundation, he has spent 19 years in the industrial robotics industry.

**TONY NORMAN**  
Co-Founder, President and  
Chief Executive Officer  
Innovation First International (IFI)  
Tony has a background in electrical engineering, an insatiable entrepreneurial spirit, and a passion for innovating the design, manufacturing, production, and distribution process.

**RONALD ARSCHEENE**  
Utica Community School Center for Math, Science and Technology  
Ron has been a long-time educator, coach, and supporter of robotics competitions. He brings an important background in education and school administration.

**PAUL D. COPIOLE**  
President  
littleBits  
Paul has more than 20 years of engineering management experience, bringing a strong background in educational and competitive robotics products to the company.

### Our Sponsors

The Robotics Education & Competition Foundation is grateful for the generous support of our sponsors who partner year-round to provide team grants, and support local tournaments, state championships, and the VEX Robotics World Championship. We value their commitment to advancing student interest and engagement in STEM.

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**OUR SPONSORS**

Northrop Grumman Foundation  
VEX Robotics  
Innovation First International (IFI)  
Hexbug  
Rack Solutions  
Texas Instruments  
Robot Weld  
MathWorks  
Robot Mosh  
Microchip  
Toyota  
Autodesk  
TVA  
Tesla  
Nordson  
Autodesk  
Robotics  
Robot Weld  
Robot Mosh  
MathWorks  
Microchip  
Toyota  
Volkswagen  
United Parcel Service  
Tata Consultancy Services  
Zeon  
Panasonic  
Intel  
Palmetto Partners  
Tennessee Valley Authority  
Chevron  
Kentucky’s Touchstone Energy Cooperatives  
EAST KENTUCKY POWER COOPERATIVE