167 Iowa City Robotics

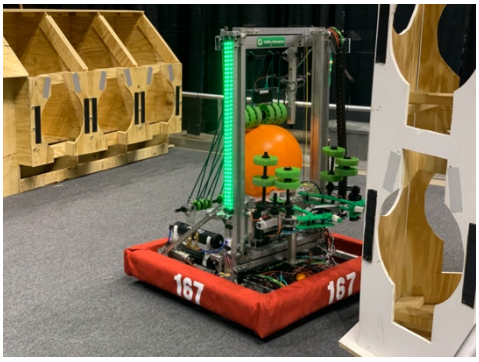
December 2019 Newsletter

Iowa City Robotics has had a very busy year. We started off by watching the 2019 kickoff livestream together to learn about this year's game: DESTINATION: DEEP SPACE®. We then had six weeks to design, build, and program a robot to complete the challenge. After those six weeks, we attended two regional competitions where we competed against dozens of teams from across the country. At each competition, we reached the elimination bracket. Unfortunately, we did not qualify for the world championship. However, we still had plans for the rest of the year.

During the summer, we hosted summer camps for little kids in LEGO® Robotics and Python programming. Additionally, our team was involved in several outreach events to share our passion for STEM with the community and to recruit new members. We capped off the year by holding a mock build season to train our new members. Our team would like to thank our sponsors for their continued support of Iowa City Robotics. We look forward to the 2020 season and continuing our mission of STEM education!

Build Season

On January 4, our team watched the kickoff livestream and game reveal video together. We then began brainstorming designs for our robot. We decided that our robot should be able to score both types of game pieces: cargo (large rubber balls) and hatch panels (plastic discs). We designed it to maximize our scoring potential using battle-tested components. It features a six-wheel tank drive for stability and power, a pneumatic claw for picking up game pieces, a telescoping elevator for scoring at different heights, a vision system using the Limelight 2 camera, and much more. After six strenuous weeks of prototyping, building, wiring, programming, and testing, we finished our robot—Thwack.



Thwack carrying a cargo

Lake Superior Regional

At the beginning of March, our team traveled to Duluth, Minnesota to compete in the Lake Superior Regional competition. The competition was held at the Duluth Entertainment Convention Center. Another regional event, the Northern Lights Regional, was held at the same time. Between the two events, over 120 teams competed in Duluth that week. As usual, one of our mentors volunteered as a referee at this competition.

Thwack lifts a hatch panel to the top level

Our team arrived in Duluth late at night. The day after our arrival, we set up our pit and began practice matches. This allowed us to fine-tune our autonomous code and give our drivers practice. Throughout the next two days, we played in nine qualification matches. To our dismay, we went 4-5-0. However, we were selected to compete in elimination matches as part of Alliance 4 along with teams 5348 from Cokato, Minnesota and 4728 from Cold Spring, Minnesota.

Our alliance quickly defeated Alliance 5 and advanced to semifinals by winning two consecutive matches. There, we faced the top alliance. After several match replays due to field issues, we came out on top. This put us into finals against Alliance 2. Unfortunately, we lost to that alliance in a best-of-three series. It came down to the final match. Despite this emotional loss, we were regional finalists. This was our team's best regional performance since 2012.

Our drive team with our alliance partners

Seven Rivers Regional

In early April, we traveled to La Crosse, Wisconsin to compete in the Seven Rivers Regional. Again, one of our mentors volunteered his time as a referee. Our team improved upon its performance at Lake Superior in several ways. Notably, we partnered with team 967 from Marion, Iowa to scout matches. With our combined scouting data, our team was able to develop better match strategy. This, along with several robot improvements and more drive practice, resulted in an improved qualification match record of 8-2-0.

Our drive team with our alliance partners

With our significantly improved record, we were the sixth seed out of 54 teams. After the first alliance captain picked the second, we became the captain of Alliance 5 for elimination matches. We chose to ally ourselves with teams 7021 from Arcadia, Wisconsin and 3061 from Naperville, Illinois. Our alliance beat Alliance 4 in two matches. However, we lost to the top alliance in semifinals after three matches. Although we didn't reach finals like at the Lake Superior Regional, we felt that our performance was significantly better overall.

Junior Bots Camps

Over the summer, the team hosted summer camps for kids from grades three to eight. Kids from grades three to six were eligible for LEGO Robotics camp, and those from grades five to eight were eligible for Python Programming camp. We held two week-long sessions of camp: July 29-August 2 and August 5-August 9. Between the two sessions, we helped to teach 27 kids about robotics and computer programming!


Team members help campers to build LEGO robots

At LEGO Robotics camp, kids learned about the basics of robotics using LEGO MINDSTORMS® kits. They learned how to design, build, and program robots to perform simple tasks. The week culminated in a robot-sumo competition. At Python Programming camp, kids learned the foundations of computer programming. They learned about variables, data types, loops, arrays, and graphics by building a variety of programming projects. They finished the week by building a project of their choosing to show their parents.


Programming campers work on their projects

The summer camps are designed to inspire students to pursue robotics and computer

programming in the future. By this measure, we found them to be a huge success. Several kids expressed interest in joining our team when they reach high school.

Outreach

Throughout the year, our team participated in several outreach events intended to spread our passion for STEM with the community—especially young children. At the end of the 2018-2019 school year, we visited elementary schools and talked to kids about our team. We answered their questions about STEM and gave them a demo of Thwack.

A child plays catch with Thwack

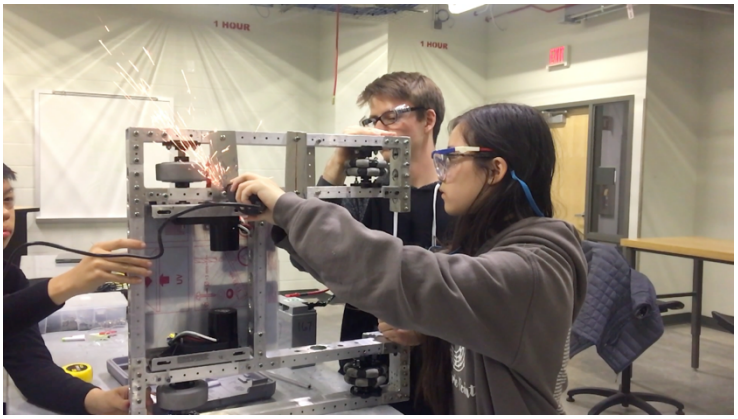
At the beginning of the summer, the team took part in two back-to-back STEM events. On May 31, we set up an interactive robot demo at STEM Family Free Night at the Iowa Children's Museum. We let kids drive our robot and practice scoring rubber balls into a large garbage can. The next day, we ran a booth at the Iowa Arts Festival. We let kids play catch with our robot and talked to parents about Junior Bots camps.

On October 10, we participated in the Johnson County STEM Festival at the Kirkwood Regional Center. We let kids practice playing catch with the robot and talked to them about our team. We also talked to parents about what our team does and about summer camps for next year.

Children interact with Thwack while their parents learn about the team

Battery Boost

After heavy recruiting at school club fairs, our team swelled to over 30 active members. Many of these members were completely new to robotics. We needed a way to train new members while still keeping returning members engaged. To that end, we decided to hold a mock build season. Our mentors designed a miniature FRC game called Battery Boost and split us into two teams composed of a mixture of returning and new members. Each team had limited supplies and roughly two months to build a competition robot.



A new team member works on her mock build season robot with the help of a student mentor

During the mock build season, returning members served as student mentors and trained the new members. Meanwhile, the adult mentors were hands-off. This was a valuable learning experience for all students involved. On November 21, the two teams competed in a best-of-seven series. Each team won multiple matches. In addition, each team gave new members several chances to drive during the event. Overall, the mock build season proved to be incredibly successful as a learning opportunity.

Without our incredible sponsors, our team would not be able to operate. We would like to thank each and every sponsor for its continued support of Iowa City Robotics and STEM education!

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