



Iowa City Robotics

March 2020 Newsletter

On March 12, our team learned that the remainder of the FIRST® Robotics Competition season had been suspended due to the COVID-19 outbreak. We were deeply saddened by this news but understood that it was necessary to keep people safe. As we head into the summer, we intend to continue pursuing our passions in STEM with offseason competitions and outreach events like our [Junior Bots camps](#).

Although it came to an abrupt ending, our 2020 competition season was among the most successful in team history. Here are a few of the highlights from the season:

Build Season

The build season began on Saturday, January 4 with the kickoff livestream. The team met in the morning to learn about this year's game: [INFINITE RECHARGESM](#). In this game, alliances of three teams compete to launch dodgeballs (power cells) into several goals, rotate and position a color wheel (control panel), and climb a tilting metal bar (shield generator) while keeping it level to the ground. After several strategy meetings, we decided to build a short robot that could avoid defense by driving through protected zones on the field. We prioritized consistent shooting and climbing.



An early prototype of the indexing wheel

With these goals in mind, we began the construction of our robot. Named Replay, it uses an over-bumper intake to collect power cells. These power cells are then run through an indexing wheel with five compartments. An omni wheel pulls the balls through our turret and into a hooded shooter. While maintaining accuracy, the shooter has a range of approximately 30 feet. In addition to power cell-scoring mechanisms, our robot contains a light-weight elevator to lift


a plastic hook to the shield generator. We use a winch with a ratchet gearbox to pull the entire robot up and stay balanced.



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After constructing the robot, we worked on developing autonomous code and controls for our drivers. Our primary autonomous routine scores six power cells in the upper goal from the side of the field. This high-scoring autonomous mode allows us to gain early leads in our matches. Our secondary autonomous routine scores four power cells in the upper goal from the center of the field. This autonomous mode complements alliance partners that score from the side of the field.

A video showing off some of Replay's features is available on the team YouTube channel [here](#).

Corn Dog Classic Scrimmage

On Saturday, February 22, the team drove to Cedar Falls to attend the Corn Dog Classic scrimmage. This event, hosted by team 525, gave teams from all over the state a chance to practice driving on a full field with other teams. We spent the first half of the day using the field to test our power cell-scoring mechanisms. We identified several improvements we could make to our robot such as changing the material on our intake and adding a plastic guide under our turret. Later in the day, we ran full practice matches against other teams to give our drivers practice.

Lake Superior Regional

In early March, we headed north to Duluth, Minnesota for the Lake Superior Regional. The Duluth Entertainment Convention Center hosted the event, along with another regional competition: the Northern Lights Regional. 63 teams from Minnesota, Iowa, and Wisconsin competed at the Lake Superior Regional while 59 teams—including one from Sweden—competed at the Northern Lights Regional.

We drove to Duluth on Wednesday, March 4 to set up our pit and check into the hotel. On Thursday, we spent the morning fixing our robot to pass inspection and calibrating our vision system to the real field. Then, we used the remainder of the day to adjust to the low-quality competition balls, give our drivers practice, and refine our autonomous programs. Qualification matches began Friday and ran through Saturday morning. We had a relatively good qualification record of 6-3-0. Out of the 63 teams, we finished seventh.

The highest-seeded team, team 1816 from Edina, Minnesota, selected us as the first overall pick to join their alliance. Also on Alliance 1 was team 5464 from Cambridge, Minnesota. Our alliance



stood out for its high-scoring autonomous routine, quick scoring during the teleoperated period, and reliable climbing during endgame. These qualities made our alliance practically unstoppable. We finished with a 6-0-0 playoff record, winning our first regional competition in our team's 23-year history. This performance qualified the team for the world championship in Detroit, but that event was canceled due to the COVID-19 outbreak.



A successful endgame climb with our playoff alliance



Our playoff alliance

of the highest scores of the entire event. This was a fitting ending to the most successful regional competition in team history.

During the awards ceremony, our entire team was recognized on the field. After awards, we faced off against the winning alliance from the Northern Lights Regional as part of the annual Duluth Double DECCer competition. Although the match was unofficial, our alliance won with one



Our team poses with our robot and our blue banner—one of the trophies given to each team on the winning alliance



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