Students build a warehouse robot, then test it against others in head-to-head competition

Strong debut for Voyageurs at First Robotics

M. McKinnon

Atikokan High School students Kiera Cameron (grade 9) and Eiji Moller (grade 12) teamed with tech teacher Graeme Bond, education assistant Sue Hayes, and parent Mike Cameron to put the AHS Voyageurs on the First Robotics map earlier this month.

They designed and built robot, then put it to the test in a series of thirteen one-on-one competitions against 38 other teams over two days at Durham College. The robots are like those used in giant warehouses; they are designed to move around picking up and placing boxes. At the more advanced levels of competition, the robots have to lift two or three times their own weight and be able to climb.

The competition mimics a video arcade game, with a variety of ways to score points. Each competition includes a period when the robots must run autonomously, and another period in which the students may use remote controls.

"There were well over a thousand people in the hall, with multiple competitions going on at once... it was a very intense atmosphere," said Bond.

"We're not a club - we're a team, competing in a sport," said Keira Cameron.

Robotics competitions are growing ever more popular at the high school level right across North America, and are becoming very lucrative for students who succeed.

"I first heard about this while taking a course last summer," said Bond. "It's growing very quickly, and there are now millions of dollars in scholarships going to student participants."

He applied on behalf of the school to the Argosy International Foundation for funding to get a starter kit and travel money to enter a competition. The kit didn't arrive until mid-December, included motors, batteries, control system components, construction materials, a mix of additional automation components - and very limited instructions.

At that point there were four students involved, but it quickly became apparent that joining the robotics team meant as big a time commitment as being on a sports team, so two had to step back. That left Cameron, the computer programming specialist on the team, and Moller, a tech student in his first year at AHS. Working with Bond and a couple of volunteer adults (Cameron and another), they turned a corner of the auto shop into robotics central. (Several components were assembled in the wood shop, too.)

Here is how First Robotics describes its program:

"FIRST®, an acronym that means For Inspiration and Recognition of Science and Technology, is an

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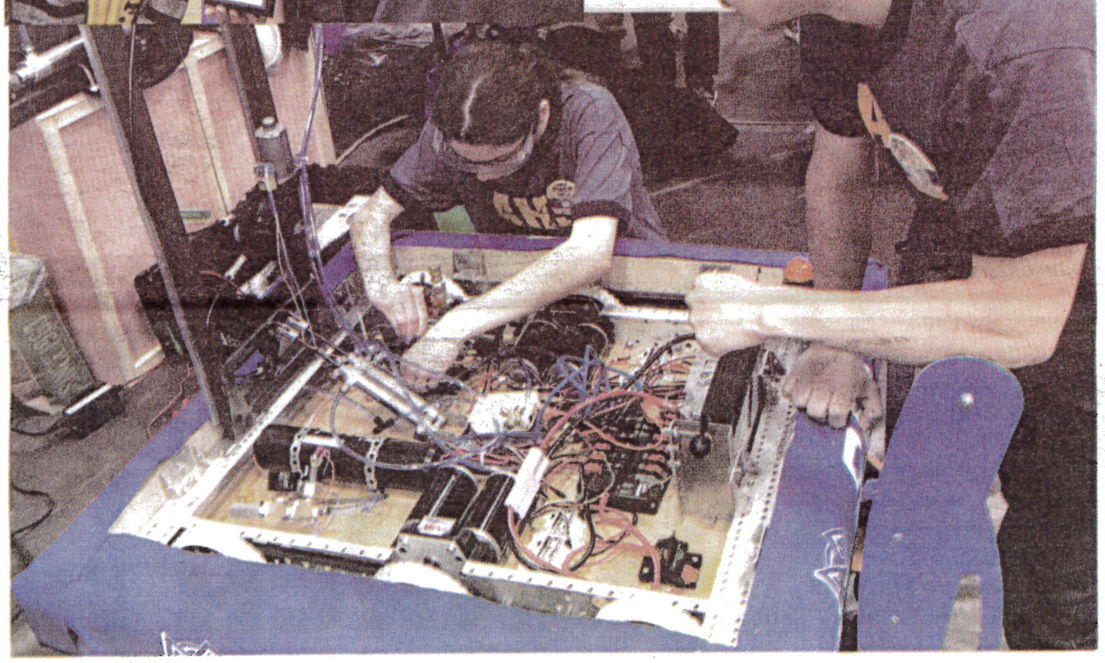

Below, Keira Cameron and Eiji Moller work on 'Corn chips', their entry in the First Robotics competition at Durham College in Toronto last weekend. At left, they show off their rookie team award with a members of the WAFFLES team who pitched in to help them during the competition. WAFFLES is a Kingston volunteer-run, not-for-profit that coordinates a full range of programs, from Lego Junior leagues (ages 6 to 10) to First Robotics competition teams (grades 9-12). AHS PHOTOS

Robotics competition "like becoming part of a big robotics family"

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international not-for-profit organization in charge of this robotic competition that encourages young people to solve an engineering design problem in a competitive way, while building self-confidence, knowledge, and life skills. First Robotic competitions combine the excitement of sport with the rigors of science and technology."

To build their robot, the students had to develop a wide range of skills, including design, fabrication, electronics, pneumatics, and computer programming.

"I was just getting comfortable with very basic programming, then had to jump right up to Java. It was a challenge," said Keira Cameron.

"I have some shop experience, but the robotics was all new to me," said Moller.

This robot is truly their design; for instance, the lifting mechanism is a window motor they scavenged from a van in the auto shop.

At the competition, all of their knowledge and skill were put to the test. Breakdowns were the norm, and not just for this rookie team (the smallest team in the competition). Their robot (Corn chips - " 'cause it breaks so much") made it through just four of the thirteen competitions intact. So as soon as each competition was over, a mad dash to find and fix the problem would begin. There was usually twenty to forty minutes between competitions.

That's where the real spirit of First Robotics came through, said Bond. A group of engineering students from Durham College was on hand to help; a couple of them basically adopted the Voyageur team, returning again and again to offer help and advice. The other teams were just as helpful - between events.

"It was a competition, very definitely, but it was more like you were becoming part of a big robotics family," he said. It wasn't just students and teachers involved, either; most teams were like Atikokan's. "It was easy to see there was a lot of community involvement - some teams even had sponsors putting in big money. And there were a lot of mentors there, people giving back what they had gotten during their development."

The students were quickly caught up in the spirit of the event and were learning by leaps and bounds. And they did amazingly well.

"I figured we'd be last for sure," said Mike Cameron. "None of us had even seen one of these competitions before."

In the end, the Vs came within a few penalty points of making the play-offs - their final standing was twenty-sixth in the field of thirty-eight teams. They were also recognized as the third best among the nine rookie teams. (Most of the other rookie teams had teachers or community members with First Robotics experience.)

"We beat one team that has been coming to these events for fifteen years!" said Cameron.

The students hope to be able to return to Toronto for another competition this coming weekend, this one at Ryerson University. It's going to depend on funding, said Bond.