

Perspectives charter school and Lane Tech will be among the schools competing for title of world's best robot builder

Ingenious assembly required

By BARBARA BROTMAN
Tribune reporter

If their robot was ever going to fling Frisbees well enough to win a world championship, the students at Perspectives/IIT Math & Science Academy had work to do.

Joe Michaelis, head coach of the Bronzeville school's robotics team, ran through the assignments.

"Electrical: We have new sensors," he said. The kids handling the robot's electrical system had to figure out how to mount those sensors on their robot's motor shaft.

"Mechanical: We need to have two motors with 8 mm shafts," Michaelis said. "Programming: ... We have to get the code running."

Jovan Goolsby put on protective goggles. James Allen took a position at the laptop. Dawn Rayford picked up one of the new sensors and started examining it.

Five years after the school's decidedly dismal entry into the world of engineering-based team sports, the Iron Wolves are headed to St. Louis to compete in the FIRST (For Inspiration and Recognition of Science and Technology) Robotics Competition championship, which starts Wednesday.

The small charter school is one of two Chicago public high schools, the other being Lane Tech College Prep, to qualify for the world championship through the recent Midwest Regional at the University of Illinois at Chicago.

Teams have six weeks to build a robot that must perform specific tasks — this year, it's throwing Frisbees — and they are matched against other teams' robots.

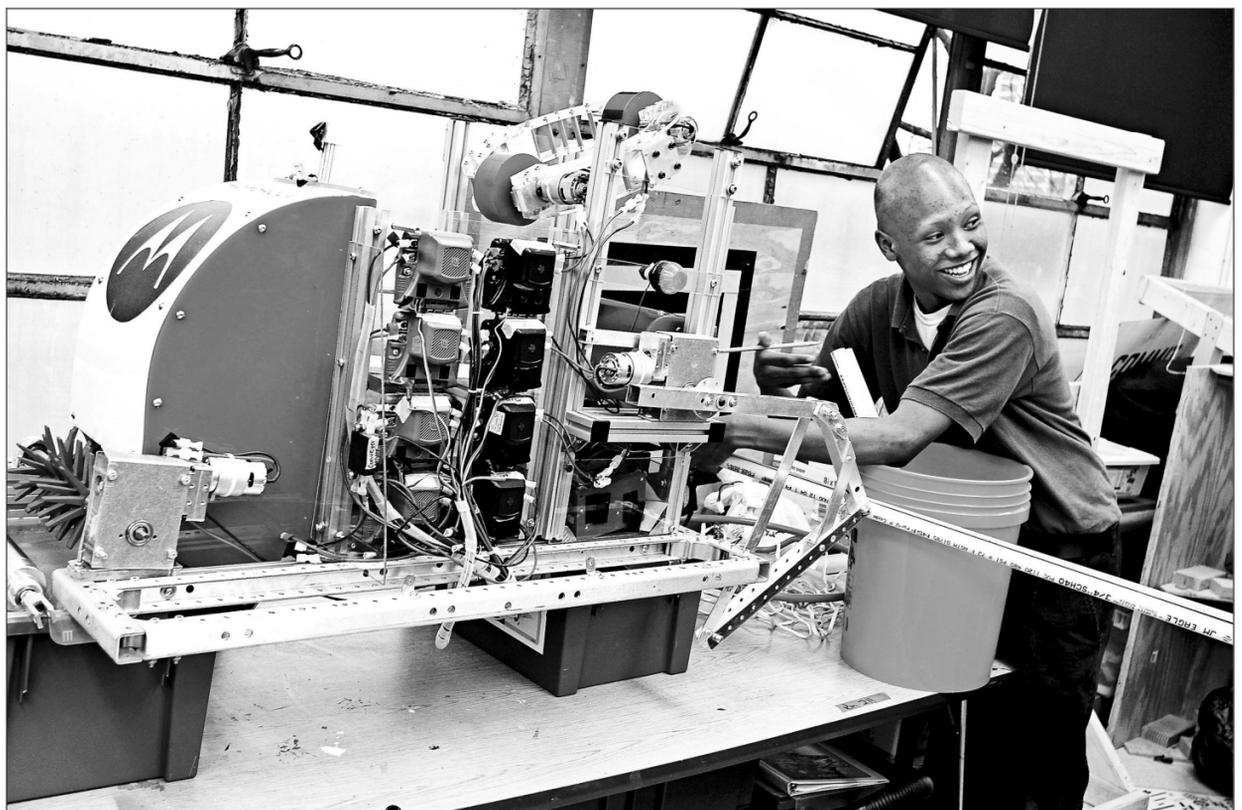
The competition tests strategy and teamwork and requires teams to form alliances with others. Each match pits three robots against three others.

Competitions look like a cross between Star Wars and bumper cars. In video of the Midwest Regional, robots wheel across the floor, periodically ramming or spitting out Frisbees. In another point-earning task, some robots climbed metal towers and hung from the horizontal supports like mechanical gymnasts.

The Iron Wolves were aware they faced tough competition at the regional contest.

"We were going up against teams that were really well-known. We were going up against college prep schools," said Zhanelle Mitchell, one of the team's programmers.

Glory seemed unlikely five years ago, when the charter school began a robotics team under the guidance of an inexperienced Michaelis. Though he had taken some engineering classes at the University of Wisconsin, his major was philosophy.



PHIL VELASQUEZ/TRIBUNE PHOTOS

Jamari Jackson, 15, a student at Perspectives/IIT Math & Science Academy, works on a robot in preparation for the showdown in St. Louis.



Mentor Arash Kalantari, from left, Dawn Rayford and Michael Watkins, both 16, make electronic adjustments at the Bronzeville school.

"To be quite honest, I was somewhat tricked into taking on the role of head coach," said Michaelis, now the school's science instruction leader. "I really had no idea what I was getting myself into."

"We weren't exactly the best team at first," said Sean Taylor, an engineer at Motorola Solutions who has volunteered as team mentor from the start. We weren't one of the suburban schools that had all these resources. We really struggled. For us, a victory was to score a single point. Our first year, we were happy because we were 63rd instead of last place in 64th.

"People would cheer for us because we were the underdogs."

For their soccer-playing robot four years ago, "we just fashioned a foot out of sheet metal and moved it back and forth," recalled Goolsby, one of the few seniors on this year's Wolves'

team. "We were kind of in our low-tech stage."

But they moved past that stage and learned about torque, speed, RPMs. Joined two years ago by another mentor, Arash Kalantari, a doctoral student at the Illinois Institute of Technology, the team learned about computer-assisted design and how to cut pieces with a laser.

Goolsby loved what he was learning so much that he began making suggestions at home for rerouting the flow of the air conditioner or shortening the family car's fuel line.

"They said, 'OK, Javon, calm down. Everything is working fine,'" he said. "But they like that I think about things differently now."

The team's robots got more sophisticated, but still fell short of perfection. The kids named their 2011 robot Big Baby, because, as Dion Powell put it, "he had so many issues."

This year's robot, Baby Red,

had a few issues too. At a regional competition in Cincinnati only two weeks before the Midwest Regional, "we were horrible," team captain Mario Franco said, cheerfully.

Every system failed, leaving the robot severely impaired. "It was twitching," Franco said.

They redid the wiring, took Baby Red apart and put it back together. Allen reprogrammed it five times, talking out loud as he went over the robot's requirements. "Other teams were staring at me," he said.

The competitive damage had been done; the team finished in the bottom third.

But the rebuilt robot was ready for the regionals.

When they realized the three-team alliance they were on had won, the kids cheered; a few cried. "It was like those four years of work were worth it," Goolsby said.

"Joe and I always thought in the back of our minds, 'Wouldn't it be cool if we were able to do the David vs. Goliath victory?'" Taylor said. "When it happened it was, like, wow, the kids really pulled it off; they're going to be able to compete with the big guys."

The school plans to give the team a confetti parade before the students head by bus to St. Louis on Wednesday. They will face about 400 teams from as far away as Israel and Australia; anticipation runs high.

It does, too, at Lane Tech, a first-year robotics team that won its berth by nabbing the Midwest Regional rookie all-star award.

"We're just ridiculously hon-

ored to be even going to the championship," said Kalina Fleming-Lopez, a senior on the team, X-Machina. "We weren't expected to get this far in our rookie year."

And in robotics, competition comes second to community, said Kent Lopez, the X-Machina team captain.

"Everyone there just likes robotics so much that they are more than willing to help people, even if they are ... the opposing team in the next match," he said. "Even if they can't help, they'll find someone who can. It's a really nice atmosphere."

This will be senior Goolsby's last competition with the Iron Wolves. Planning a career as a mechanical engineer, he is looking at the University of Illinois at Urbana-Champaign and the Milwaukee School of Engineering.

"These kids are going places," Taylor said. "They're going to have degrees; they're going to have jobs. They think they're having fun right now, but they're going to look back and look at a teacher like Joe and say, 'This is why I'm able to do what I'm doing now.'"

Regardless the outcome of the championship, he said, the Iron Wolves have already won.

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robots

Video: See the robotics team in action.

Lawyer for ex-water official says she was only clerk

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than two decades to avoid the cost of fixing leaky water mains.

Neubauer, on paid leave as the Crestwood police chief, faces 11 counts of making false statements in public documents intended to keep track of the village's water use and assure residents that their drinking water was safe. Prosecutors dropped 11 other counts before Neubauer's trial began in U.S. District Court.

A name repeatedly spoken during opening statements was that of former Crestwood Mayor Chester Stranczek, who led the village of 11,000 for nearly 40 years and often said he ran it like a business.

Stranczek is listed as "Public Official A" in court documents that identify him as one of the officials who, along with Neubauer, signed federally mandated Safe Drinking Water Act reports. The documents, sent annually to village residents, stated that Crestwood's only source of drinking water was Lake Michigan water treated by Chicago and purchased from neighboring Alsip.

In fact, water from the Crestwood well at times accounted for up to 20 percent of Crestwood's drinking water, according to village records. A 2010 study by the Illinois Department of Public Health found that toxic chemicals in the village's drinking water could have contributed to "significantly elevated" cancer rates in Crestwood, though researchers



MICHAEL TERCHA/TRIBUNE PHOTO
Theresa Neubauer, former water supervisor and current police chief of Crestwood, arrives at the federal courthouse Tuesday.

could not make a definitive link.

In other fliers sent to residents, Stranczek boasted that Crestwood offered the lowest water rates in Cook County and proclaimed that village water was "Good to taste but not to waste!"

Court documents allege that Stranczek ordered Neubauer, Scaccia and other village employees and contractors to use the contaminated well and "keep quiet" about their activities. But federal prosecutors opted not to charge Stranczek. Attorneys defending him in ongoing civil cases hired experts who concluded that the former mayor, who stepped down in 2007, has "mild to moderate" dementia caused by Parkinson's disease and is not fit to stand trial.

This month, just days before Scaccia was scheduled to go on trial, the former Crestwood employee pleaded guilty to one count of making a false statement. He could face up to 27 months in prison and a \$250,000 fine for his role in cloaking the use of the tainted well.

Most of the first day of Neubauer's trial focused on a methodical review of Crestwood's monthly and annual water reports filed with state and federal regulators.

Like Chicago and other Illinois communities that rely on water from Lake Michigan, Crestwood is allocated a set amount to ensure the state complies with a U.S. Supreme Court order limiting daily withdrawals.

Crestwood, though, had "substantial leakage" in its distribution system, according to court documents.

State law requires local officials to report on their sources of drinking water, list the results of periodic water quality testing and document how much water is lost through leakage. Several reports displayed on a courtroom screen were signed by Neubauer.

By secretly drawing water from their contaminated well, Crestwood officials saved \$380,000 a year that otherwise would have been spent fixing leaky water mains, according to court documents. They also avoided routine testing that would have detected toxic chemicals in the village's drinking water.

The village's monthly use of the well was outlined in separate, handwritten village documents that prosecutors presented in court. A secretary at Crestwood Village Hall testified that the handwriting is Neubauer's.

"Once the lies began, they only escalated," Erika Csicsila, an assistant U.S. attorney, told the jury. "The defendant didn't do her job. Instead, she and other Crestwood officials told lies, year after year, decade after decade."

Brayman appealed to the jury to see Neubauer as a mother working hard to support her family and said she was too minor of an official to be put on trial.

Neubauer started as an assistant village clerk at 18 and later took a second job as a "community service official" patrolling Crestwood's malls and business district, Brayman said. She also has served as water department supervisor and police chief.

"Where does Theresa Neubauer fit into the power structure of Crestwood?" Brayman said to the jury, noting that she cooperated with federal investigators who interviewed her after an April 2009 raid on Village Hall.

David McMillan, an official with the Illinois Environmental Protection Agency, testified that state files contained no records of Crestwood testing its well for hazardous chemicals.

EPA officials told Crestwood in 1986 that the well was contaminated, according to state records.

Village officials responded by saying the well would be used only in emergencies, but it wasn't shut off until December 2007.

The long legal battle has cost Crestwood nearly \$6 million in attorney fees and forced elected officials to cut off the annual property tax rebates that drew national attention to the village's penny-pinching ways.

Insurance has covered about \$1.6 million, according to a tally provided by John Toscas, a village trustee. Disputes about other claims are pending in court.

Some of the most expensive legal bills are related to Stranczek's defense in ongoing civil cases, including one filed by Illinois Attorney General Lisa Madigan that accuses Stranczek and other Crestwood officials of lying about the tainted well.

Gov. Pat Quinn and state lawmakers responded to the Tribune investigation by requiring more frequent monitoring, prompt disclosure of water contamination to consumers and tougher penalties for deceiving state officials.

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well

Read the Tribune's years of watchdog coverage on Crestwood's tainted well.