

## Building for Tomorrow: ARL Mentorship in Robotics Inspires Youth, Employees Alike



Triple Helix team member prepares robot of October's Robot Rumble competition. The ARL-sponsored team from Menchville High School, Va., won the challenge with the help of VTD mentors. (Courtesy photo)

In a dramatic come-from-behind victory, an ARL-sponsored high school robotics team won an off-season competition in Virginia in October and cemented its reputation as a true contender in the upcoming 2010 For Inspiration and Recognition of Science and Technology (FIRST) Robotics Competition season, which will kick off on Saturday, Jan. 9.

The FIRST competition is designed to inspire high school students to become engineers by giving them real-world experience working alongside professional engineers in developing a robot.

"I would have to place my mentorship of a FIRST Robotics Competition team as one of the most satisfying of my career," said Matt Wilbur, team leader in the Mechanics Division of ARL's Vehicle Technology Directorate at Langley, Va. Wilbur, who volunteers as the team's head

coach and fabrication mentor, added that “(e)very year there has been at least one student that you can tell has clearly turned the corner in their life because of their involvement in FIRST.”

Wilbur and other ARL mentors led the FIRST Robotics Competition team, Triple Helix, from Menchville High School in Newport News, Va., to participate in the off-season event, the Robot Rumble, at the Virginia State Fair. The team finished the qualification matches and seeded fourth out of 14 teams, then went on to win the championship during the elimination tournament. ARL mentors included Chester Langston , an electronics engineer in the Mechanics Division; Yolanda Hinton, a mechanical engineer who serves as an ARL technical assistant to the director; and ARL retiree Bill Yeager, an aerospace engineer.

Wilbur helped start Triple Helix as team sponsor in 2007. He had been volunteering as a supporter of the NASA Knights, another team in the competition.

“I felt that expanding with an additional team in the area was a really good idea, so I jumped on it,” he said.

Wilbur explained that the team’s name derives from the double helix of human DNA. The team added the third helix as a physical representation of the type of roller chain often used in the robots, particularly in the drive train.

“The significance of the three helices intertwined is the merger of human DNA with robot DNA to form a better, more capable and powerful organism featuring the best of both human and robot characteristics,” Wilbur noted. “In effect, our team represents a super-organism combining human and machine.”

The team currently consists of 18 students; three juniors, 10 sophomores and five freshmen. It meets year-round, although their schedule slows down significantly in the summer. In the early autumn, the team meets for two hours after school. Financial relief is available to students who cannot meet the financial burden of membership. As winter approaches, the team meets once a week to prepare for the build season. Once the competition is announced, the team meets on Monday, Tuesday, and Thursday evenings for three hours, and on Saturday for nine hours.

“The FIRST Robotics Competition is a high-energy competition with the look and feel of a sporting event,” Wilbur explained. “We try to start off with some type of small-scale robot competition amongst the students to get the juices flowing. Then we transition into the mode where we are preparing for the Robot Rumble off-season competition at the Virginia state fair.”

By the fall, the robot has been dormant for several months without any significant use, and all of the systems need to be checked out, Wilbur noted. The team will often make upgrades, which introduces the new students to the robot.



ARL-sponsored team, Triple Helix, of Menchville High School, Va., discusses competition strategy in October during the Robot Rumble, a competition VTD's Matt Wilbur and others helped them come from behind to win. (Courtesy photo)

Come January, students will begin working to design, build program, and debug a robot. The grueling 45-day competition period ends with the robot being crated and shipped to a storage facility where it awaits competition.

Once the competition season ends, ARL mentors and advisors work with the students to review performance and develop a set of lessons learned so they do not repeat mistakes in subsequent years.

Another major component of team involvement is community outreach. In November, the team participated in a carnival at the Preschool for the Education of the Exceptional

Preschooler (PEEP). PEEP, an elementary school in Newport News, is dedicated to the education of children with physical and mental disabilities. Wilbur indicated that nine students and two mentors representing Triple Helix assisted at the carnival. In the spring, they volunteer as costume aids for exceptional students in PEEP's annual variety show.

Some team members go on to pursue scientific and technical education after graduating from high school. Since 2007, the team has graduated five seniors. Two went into technical career fields, and one 2009 graduate is majoring in electrical engineering at Virginia Commonwealth University in Richmond, Va. In addition, many of the current team members are considering four-year education at technical universities, and as participants in FIRST, some may qualify for its scholarship funding, which now tops \$12 million.

In many ways, continued student interest in science and technology is a testimony to ARL's involvement in the program.

"ARL's interest is in ensuring that students get the chance to find out what great fields science, math, and technology are," said Wilbur. "I would not be surprised if ARL hires someone over the next few years that came up through one of the ARL-sponsored FIRST teams when they were in high school."