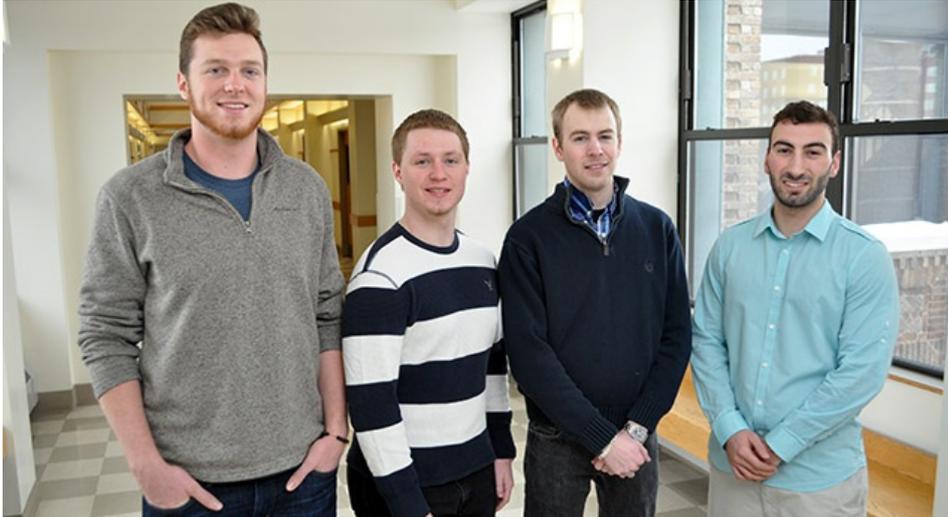


February 23, 2015

Agents of Invention



Alex Schwarzkopf, Matthew Joyal, Dylan Powers, and Sean Iacobone. Not pictured—Jennifer Roy.

The immediate future for five Wentworth Institute of Technology students is smaller than a business card. And on a cold February morning, gathered around a conference room table, these young inventors are literally holding that future in their hands.

Alex Schwarzkopf '15, Matthew Joyal '15, Dylan Powers '15, and Sean Iacobone '15—all Electromechanical Engineering majors—and Industrial Design major Jennifer Roy '16, have spent more than two years creating and assembling a thumb-sized head trauma detector. When paired with a pending mobile app, the device will monitor impact for active sports enthusiasts—gauging in real time whether a bump or blow is on the minor side or could be a concussion.

Nearly complete, the Wentworth group's prototype is about the size of a USB memory stick and designed to be tucked into a pouch inside a typical sports headband. The device rests at the base of the skull and uses two sensors: one, a gyroscope that tracks rotation, and another that measures acceleration. It is equipped with alert systems that are triggered when a forceful impact—and potentially serious head injury—occurs. Those signals tell the wearer, a coach, or parent, to stop the player and seek medical attention.

The app would allow a coach to view information about an impact, right after it occurs, on a cell phone or tablet.

The 'Accelerate' Factor

"It's been a long haul, already," says Schwarzkopf, "but totally worth it."

Months of planning have gone into each of the sensor features, with considerable work still to come. One example of the team's attention to detail is ensuring that the headband is fashionable and non-cumbersome, and won't by itself discourage wearers from using the sensor.

The team's reliance on faculty advisors—including Associate Professor of Electrical Engineering and Technology Douglas Dow, Assistant Professor of Electrical Engineering and Technology Salah Badjou, and Assistant Professor of Computer Science and Networking Jones Yu— epitomizes the Wentworth experience, highlighting the school's emphasis on doing, building and learning while preparing deliberately for a career well before the post-graduation job hunt begins.

"I am impressed by their commitment and the fact that they continuously think of next steps to improve the device," said Yu. "I believe they are solving a real problem, helping many athletes in the field and the people who care about those athletes."

A \$13,000 award from Accelerate, the Wentworth Innovation + Entrepreneurship Center, was another major factor in the team's progress. Launched in 2012, the center advances innovative thinking, builds entrepreneurial confidence, and nurtures partnerships and interdisciplinary work among students, alumni, industry leaders, and the Boston community. Accelerate supports numerous other student-generated innovation projects.

"This has been a very dedicated team, ready to iterate frequently," said Monique Fuchs, associate vice president, innovation and entrepreneurship and co-founder of Accelerate. As a result, they have looked for inspiration in tangential industries, and are on the path to developing a great product."

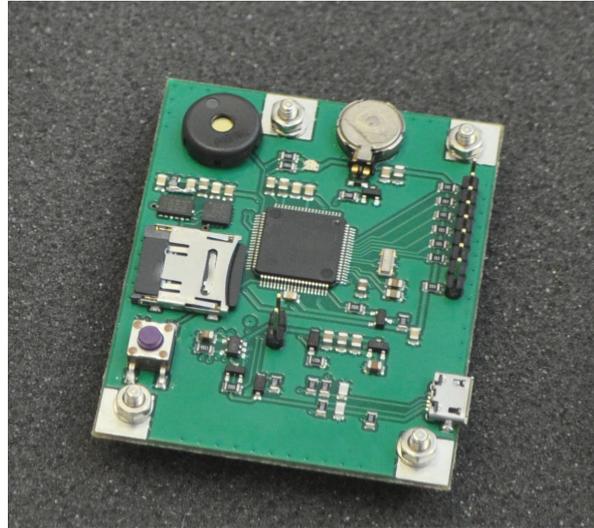
Discouraging Fear

Because concussions are a major issue from Pop Warner to the NFL, one might expect that the Wentworth group's sensor is geared toward football. But, as Schwarzkopf explains, the device is more for sports that are less represented in, or are not a part of, the national debate over athletics and head trauma. Non-helmeted athletic endeavors are also a marketing target, according to Iacobone, the group's newest member, who joined the team last September.

In the helmeted sports vein, Iacobone said hockey and lacrosse team members at Wentworth have agreed to wear and help test the sensor.

The core motivation behind the product, says Schwarzkopf, is reducing fear. He said the group wants to mitigate the concern among parents and aspiring athletes in their middle-school and early high-school years that sports might best be avoided because of the risk of debilitating, insidious head injuries.

"If you're a parent and you're making a decision out of fear to not let your kids play sports," says Schwarzkopf, "that's not a good thing. With this device, a parent or coach will have an actual tool containing information on whether a child should or should not continue playing."



An early prototype of the sensor

Motivated By Experience

Growing up, the sensor team members enjoyed sports at one level or another. Roy played ice hockey for 16 years. When she was 12 years old, she got hit from behind, suffered a blackout and, unknowingly, a concussion. She recalls thinking then that she left the game for good, early on, after her injury. But she found out after the game that she had continued playing and scored a goal in the third period.

"That experience of not knowing what was going on was very scary for me," she said. "I don't want that to happen to someone else. Maybe we can't prevent concussions, but when they do occur people need to know right away so they can seek medical attention."

According to Schwarzkopf, the detection device is expected to sell for about \$120. Joyal said the team hopes to interest athletic groups and public school associations in endorsing and using the product.

For more information about the team's work and future plans, e-mail schwarzkopfa@wit.edu.

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Dennis Nealon
617-989-4291
617-989-4168 (fax)
nealond@wit.edu

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