42.22° N, 83.75° W

by Dan Shine

Byte the Hand that Keyed You

LSA students are part of a University of Michigan group dedicated to computer hacking. But this isn't the rise of the next Anonymous. Instead, campus programmers collaborate to create code for products that help make the world a better place.

PHOTOS Joseph Xu/ Michigan Engineering Communications and Marketing

WITH ALL THE THREATS the United States faces — Iran, North Korea, and Al Qaeda, to name a few — President Obama has targeted something else he calls "one of the most serious economic and national security challenges we face as a nation." It's computer hacking.

So some might be surprised to hear hacking is alive and well at the University of Michigan. In fact, there's even a new student group called Michigan Hackers.

But don't let the name fool you. The student group does not participate in the dark side of hacking. There's no breaking into video games to play for free, or stealing identities, infecting computers, or trying to launch missiles.

In fact, some of the projects built by students at a recent 24-hour "hack-a-thon" included an app that gives users CPR instructions after providing a screen to dial 911, an app that shows floor plans for a U-M building of your choosing, and a buddy system that links with another smartphone to make an alert noise when the other person strays away.

"The term hacking, as used in the popular media, has a negative connotation," says Alex Halderman, assistant professor of electrical engineering and computer science at U-M, and an adviser to the group. "People think of breaking into systems, but that's not the original meaning. The much bigger idea has to do with creative, active mastery over computer systems in order to make computers maximally useful to us."

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Max Seiden, a senior studying computer science and music and a founding member of Michigan Hackers, says it's a "black hat/white hat thing" with the group.

"We like to prototype things," he says. "Hackers want to see it built, so they will sit down and build it. Our members also are interested in the security side of things. Not breaking into things, but discovering a program's vulnerabilities."

For its hack-a-thons, the students — fueled by caffeine and pizza — form teams and try to build something in 24 hours. This past November, the group held MHacks: Impact Hack-a-Thon to spur student teams to create things that can make a positive impact.

One of the requirements is that groups don't start with prototypes already in the works. Using code from an earlier project as a template, however, is allowable. A goal of the event is to bring together teams of people who normally wouldn't work with each other, start with an innovative idea, and build off of that.

Aubrey O'Neal, a first-year student majoring in German, helped develop a mobile app that could shut off a power strip at home where non-essential electronics were plugged in. They named it Chargii.

Her group divided up duties such as programming and finding hardware, and O'Neal researched whether the idea was new and how effective the energy savings could be. She later worked on a logo design, and put together a stop-motion whiteboard video — set to the ELO song "Mr. Blue Sky"— to "illustrate the depth of our idea."

Meanwhile, on a separate team, Kaitlin Flynn, a third-year Ph.D. candidate in microbiology and immunology, collaborated on a web app that could fix a flaw in Google Docs and Facebook. When people with visual impairments view these sites in high-contrast mode, the clickable buttons disappear completely.

The group went to work on an app for the Chrome web browser that allows

(PREVIOUS PAGE) **Students from universities** across the United States and Canada collaborate in Palmer Commons as part of MHacks' 36-hour hack-a-thons, where they create various web and mobile applications for prizes.

(THIS PAGE) **Alexander Biggs** (right), of the University of Toronto, and Miker Angalz (far left) of the University of Illinois at Urbana-Champaign, work in a hallway in the Palmer Commons during the hack-a-thon.

(OPPOSITE PAGE) **Chris Cole,** a student from Purdue University, demonstrates his group's creation: a digital eyepiece that translates text.

for communication between the cursor's location on a page and the highlighted buttons. The team also wanted to add a hardware component — a mouse that would vibrate every time a user hovered over a button.

Not everything went as planned. Hack-a-thon participants say it's fairly certain that most of the projects will break or fall apart, typically in the middle of the night.

Flynn's team discovered that Google specifically blocks the kind of browser-to-computer communication that the team needed to make the mouse work. At the same time, they discovered that a vibrating mouse already existed. So the team tried making a new type of mouse interface, but was unsuccessful.

As the sun rose the next morning, the team only had about 20 lines of code. They put it into a script and tried to get the script to interface with the Firefox web browser.

"It worked — sort of," Flynn says. While their idea of a mouse had to be abandoned, she says the trials and tribulations her team endured are "what the spirit of hack-a-thons are about."

That means "coming together, having a great idea, building and modifying your idea based on if something works or not, and getting help from all sorts of people," Flynn says. "And it was really fun to boot."

At the end of the hack-a-thon, 13 teams — including those with Flynn and O'Neal — gave four-minute presentations to the judging panel for a chance at some of the more than $5,000 in prize money. In addition to the top three places, awards were given for best underclassman hack, best graduate hack, people's choice, largest environmental impact, and most technical hack.

One team's app tracked a user's gas mileage, fuel costs, and overall environmental footprint. Another project allowed anonymous comment streams among Facebook friends. Still another allowed a user to listen to more than 3,000 sounds and never hear the same one twice. And for dorm dwellers, there was an app that lets a user place an order ahead of time for U-M dining halls.

Flynn's team took second place overall, while O'Neal's Chargii project took top honors. The Chargii team's presentation ran into some technical difficulties, but they were able to show the judges O'Neal's stop-motion video.

"Personally, it was extremely rewarding to me because my efforts of making the video played a definitive role in winning the award," she says.

With this hack-a-thon complete, the group is already looking to plan more. In the meantime, new ideas on impactful tools — some more useful than others — are being generated on the mgohack website under a running feature called "You Know What We Could Use" (see sidebar).

"Michigan Hackers as an organization is about bringing tech-minded, skilled people together to build something amazing," Flynn says. "It's not always about starting a company or building the next Blackberry Messenger or Facebook. It can just be about bringing a group of students together with widely varied backgrounds and seeing what comes of it. There is so much brainpower on campus — it's beneficial for everyone to put it to good use." ■

THERE'S AN APP FOR THAT

Or at least MHack thinks there should be. Here are some of the ideas for apps and tools they'd love to create, as featured on mgohack.com.

- Safe running/biking routes in Ann Arbor that are tailored to a user's typical distance
- A filter that prevents users from answering their phone if the caller is a robocall or prerecorded message
- An app that tells a person what restaurants are open at a certain time of day or night
- The "Yelp" of naps, through which users can submit nap spots around campus and would include ratings/comments on the quality of the snooze location
- An easy way to send a single message to someone, with distribution through every possible, relevant channel
- An app that keeps track of how much money a person owes friends, and sends debtors a Venmo link every month, through which they can pay up
- An app to request a cab in one click, and if multiple people request a cab from a nearby location, the app assigns them to the same cab so they can split the cost