

Gadget Time At CMU's Build 18 Engineering Fest

Adrian McCoy, Pittsburgh Post-Gazette

PITTSBURGH (AP) -- Give a group of engineering students a week, a handful of electronic parts and other miscellaneous items and see what happens.

Carnegie Mellon University's Electrical and Computer Engineering department ushers in the spring semester with the annual Build 18 engineering fest — a fast-paced challenge where students have seven days to build an imaginative and innovative product under tight deadlines and with limited funding — real-world lessons that most startups learn the hard way.

This year, 74 student teams will create projects. The goal is to build a completed working prototype with a budget of \$250.

Build 18 was organized as an alternative and complement to the structured ECE curriculum, giving students a chance to have fun and be creative while they put textbook principles into practice. While ECE's coursework provides solid grounding in electrical engineering, Build 18 gives students the experience of building something on their own.

"During the semester you're learning theory," said senior engineering major Scott Martin, one of several Build 18 officers who provide advice and mentorship to the student teams. "We needed an event where students can basically get their hands dirty."

Martin got involved in his first Build 18 when he was a sophomore. He was part of a team that built a remote-controlled blimp. "It's a great experience to be part of a team that's focused on getting something awesome done. You're around a bunch of other people who are doing exactly the same thing and trading awesome stuff."

The original idea for Build 18 came from a small group of engineering students who wanted to take on the challenge of building something cool.

"Carnegie Mellon students have this desire to do hard work. This came out of that culture," said ECE assistant teaching professor William Nace, who has been involved with Build 18 for several years and also joins one of the teams as a participant. "They weren't scared to try something new."

The event is held in the first week of the spring semester, before the demands of regular coursework kick in. But the groundwork for Build 18 starts in the fall. Students have a chance to learn additional skills they'll need from tutorials. They plan and pitch their product ideas and order the supplies they'll need. The gizmos are constructed mostly out of basic components — copper wire, plastic tubing, servos, LEDs, batteries, light sensors and microcontrollers.

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The sixth annual Build 18 runs began Saturday and runs through Jan. 17.

On Demo Day — Jan. 17 from 2 to 5 p.m. in the University Center's Weigand Gym — the finished gadgets will be displayed. That part of the event is open to students, faculty, sponsors and the public. Among this year's projects:

- Zephyr Notification Service — A blimp that picks up and delivers notes
- Clutch Coffee Clutch — A coffee sleeve with a heat sensor that responds to temperature and alerts the user when the liquid temperature is ideal.
- Afterthought: The Reboot — An audio recorder that continuously captures and stores sound, enabling the user to record something after the fact.
- Wikipedia Watch — Wrist-mounted device with a text-only version of Wikipedia.
- Laser Harp — Tesla coil capable of playing music from a Musical Instrumental Digital Interface input.
- Hydra Plant — Plant care system using sensors to monitor humidity, light, temperature and soil water content.

Build 18 is a student-run event, although the university provides space and support services.

"We want to let them have that experience of organizing and leading," Mr. Nace said.

The event is supported with help from sponsors -- tech and engineering companies that provide money to fund the projects, along with mentoring and technical advice.

Any Carnegie Mellon student can participate in Build 18, but at least one team member needs to be an ECE major. Many mechanical engineering majors take part, and arts majors bring their skills to the mix.

Working in the lab until the wee hours solving problems needed to make their devices work is a big time commitment, and students receive no course credits for Build 18.

"It's a very intense process. Many of these are very ambitious projects," Mr. Nace said. "Students are building crazy stuff and finding a way to make it work." When the lights go on and the gadget first starts to work, "There's this amazing high you get that really carries the students through."

The goal is not to come up with a product that can launch a startup.

"It's mostly the pure joy of building something, a chance to build something crazy," Mr. Nace said.

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"We tend to de-emphasize commercial viability," Mr. Martin said. "We want people to dream big and do moonshot kind of things."

Most teams finish their projects, but occasionally unforeseen technical problems come up and the product can't be completed on time.

"I don't think that's bad," Mr. Nace said. "People are really pushing in what they want to build. You end up going back and revising. That's a part of the engineering world and process."

Even failed experiments can be valuable lessons, Mr. Martin said. "It teaches you to be able to be agile and adapt to what happens when things go wrong."

Two ECE alumni will be at the festival on Demo Day and will share their experience and perspective: Thomas Marchok, senior director of business development at Qualcomm, and Manu Kumar, founder of K9 Ventures, a technology micro venture capital fund based in Palo Alto, Calif.

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