

## Student entrepreneurs develop device to combat gender violence

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Lena McDonnell '17, Lehigh University computer science and engineering.  
Credit: Lehigh Univeristy

As many as one-third of the world's women, says Lena McDonnell '17, a Lehigh University computer science and engineering major, will be the victims of sexual assault at some point during their lives. The regions of the world where sexual violence is most prevalent, she adds, are often the regions where emergency response services are least available.

Lena and her team of 13 students are adding a technological twist in the fight against gender violence with the device, [Soterra](#), which will provide women with access to emergency response services, especially those in developing countries with limited cell phone or internet access.

The students of Team Soterra [have recently learned they are finalists](#) for the \$1 million Anu and Naveen Jain Women's Safety Prize offered by the XPRIZE Foundation, a nonprofit that sponsors competitions to encourage innovators to come up with technology to solve pressing world problems.

Soterra gives women two options if they feel threatened, says McDonnell, who is captain of her group of 13 students. If a user presses the device three times, it activates a red alert, which goes to the police. If for whatever reason a user prefers not to get the police involved, she can press the device twice to activate a yellow alert that goes to a preselected set of contacts, such as friends and family members.

Last week, team Soterra was among the more than 60 enterprising students displayed 21 projects at CREATIVATE, an annual event that celebrates students' creativity, innovation and entrepreneurial spirit. Sponsored by Lehigh's Baker Institute for Entrepreneurship, Creativity and Innovation, CREATIVATE invites students to show off "an amazing creative project, an innovative research in progress, or an entrepreneurial side hustle in your dorm room."

In an estimated 80 to 95 percent of sexual assault cases, says McDonnell,

the abuser is someone the victim knows.

"In almost all of these cases," she says, "the victim is unwilling to call police for fear of escalating the situation or because she doesn't trust the police. Also, in some parts of the world, victims are blamed for a [sexual assault](#) that has occurred."



Emily Randolph '19 (left) and Michael Wu '20 (second from left) explain the Soterra advantage to visitors at CREATIVATE. Soterra uses mesh networking to provide women with access to emergency response services. Credit: Lehigh University

The Soterra team has completed the design and much of the development of its device. The goal is to develop two prototypes. The

first, a Bluetooth mesh networking solution now in development, will have a range of 1,000 feet. The group hopes later to design a radio frequency (RF) mesh networking solution with a much longer range.

Each Soterra, says McDonnell, contains a GPS system that has 50 times more geographical accuracy than a U.S. mobile 911 phone call. A barometer inside the device senses pressure and can tell responders which floor of a building a user is signaling from.

The [students](#) began working on the project in April of 2016. Their efforts continued over that summer, and kicked into high gear over the four weeks leading up to September 15, the deadline for submitting technical design documents to XPRIZE.

"We met for more than five hours a night, every night for four weeks, to work out the details," says McDonnell.

Eighty-five teams from 17 countries joined the competition for the Jain Women's Safety Prize. On Nov. 15, the Soterra group was one of 21 teams chosen by XPRIZE to take part in the semifinal round next April in Mumbai, India.

"We are beyond excited and honored to be going," says McDonnell. "We believe we've created something amazing.

"Whether we win or lose, we're not going to stop; we're going to finish this project no matter what."

Provided by Lehigh University

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