

### PREDICTING ACTIVITY

- Give students some words and phrases taken from the text (they are in the same order as in the text):  
**a firefighter / a burning building / SmartBoots / walking / see you through the smoke / a young engineer / the construction industry / out of hazardous areas / military applications / being more conscious of safety / resistance to wearable tech / invention award**
- Students work in groups to create stories by using the words and the phrases above listed. They should try to include as many prompts as possible.
- Each group can write their “story” and then report it to the class.
- The real text will finally be introduced.

### TEXT

#### **These Boots Could Save a Firefighter's Life**

*Engineer Hahna Alexander designed SmartBoots, which harvest energy from the wearer's steps, to aid workers in dangerous professions*

Imagine being a firefighter charging through a burning building. You can't see your colleagues through the thick smoke. And if you get injured, no-one knows exactly where you are either.

What if this situation, and others like it, could be solved with...new shoes.

A company called SolePower hopes to do this and more. SmartBoots use the energy generated by walking to power various sensors embedded in the sole. In the firefighter scenario, tiny lights powered by your steps would help colleagues see you through the smoke. If you stop moving, it could alert others that you need help. Other types of boots are equipped with GPS, and can sense whether the user is moving and how fast, check temperatures and more.

The SmartBoots were invented by a young engineer named Hahna Alexander, who designed the first prototype as an engineering class project. Now, the company she cofounded is working with the military and industry to develop a variety of uses for the boots.

Users of SmartBoots are “industrial workforces in dynamic, dangerous environments,” Alexander says. This includes the construction industry, which Alexander hopes to make safer and more efficient. Here, a type of SmartBoot can collect location and motion data and send it to the cloud to be analyzed, helping operations managers and safety professionals better understand and control the flow of workers. This could allow them to keep workers out of hazardous areas, and to move workers and equipment in more efficient ways. If it turns out that workers are, say, walking across the job site multiple times a day to get a commonly used material, it would let managers know they need a more efficient layout.

“Currently, there's no smart and automated tool to manage industrial workers,” Alexander says. “This means many inefficiencies and safety issues go unnoticed and not logged.” The company is working on military applications as well, focusing on location monitoring and on tracking physiological data, such as whether the wearer is stumbling or slowing down because of fatigue.

Alexander says it's surprising that wearables like SmartBoot haven't already been adopted by industry. One of the reasons she's found is that workers themselves are likely to reject protective equipment if it's cumbersome. So something like SmartBoot, which isn't an additional piece of equipment and doesn't require charging, might have an advantage.

There's another reason, though. Wearable tech can “potentially assist in safety improvement, especially if the technology assists workers in being more conscious of safety and the monitoring/tracking is live and available at the worker level,” says Syed M. Ahmed, a professor of construction management at East Carolina University who isn't involved with SmartBoot. “Unfortunately, there has been some worker resistance to wearable tech because the data has often been used to penalize incorrect actions instead of providing incentives for positive actions.”

The boots work by using kinetic chargers embedded in the heel. This generates power using the compression from each step the wearer takes. The company partners with the work shoe manufacturer SR Max to make the boots.

Earlier this year, Alexander won Toyota's Mother of Invention award, given to female inventors, innovators and entrepreneurs, which comes with a \$50,000 grant.

Alexander says she was "incredibly honored and thankful" to win the award.

"When I think back to my mentors growing up, many of them were women," she says. "I believe highlighting women working on amazing things is critical to uplifting future inventors, and giving confidence to women that are considering taking a risk."