THE GLOBE AND MAIL

Technology

Canadian company develops thought-control technology which uses brain waves

If you can plug it in, you can control it with your brain

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It may sound like science fiction, but using your brain waves to control the environment around you, like the lights in your home or even your toaster, is already a reality.

One Toronto-based company has developed a system called thought-control computing and it's exploring a range of commercial opportunities that include screens on airplanes and video games.

Its philosophy is simple: If you can plug it in, you can control it with your brain.

Ariel Garten, CEO of InteraXon, says the possibilities are endless.

“Basically this is ultimately going to be the way that we engage the world on daily basis,” she said in an interview.

“This is the way that we're going to be controlling the lights in our homes, controlling our household products, (and) dialling our mobile phones.”

The technology involves a regular-looking headset — but one embedded with electrodes that read brain waves. The brain waves are then processed on a computer.

“When you focus, you create beta waves; when you relax, you create alpha waves,” Garten explained.

She says once a person learns to control the alpha and beta waves, the “control signal” can

then be used to program anything from lighting, to music, to motors.

It was demonstrated earlier this year at the Vancouver Olympics where visitors used their brain waves to control the lighting on three landmarks: the CN Tower, the Parliament buildings and Niagara Falls.

“For the CN Tower for example, as you focused, you could make the lights rotate around the ring faster and faster . . and if you would relax, you would slow the rotation down,” Garten said.

A Canadian Press reporter who visited InterAxon's office to test the technology confirmed that it works, but that its uses seemed to be quite limited at this point.

While wearing a headset connected to a computer, the reporter was able to control music — moving from a fast to a slow pace — by merely focusing or relaxing.

Garten says thought control has already helped the American archery team improve its scores and the technology has also been applied to golf.

“The system actually helps you improve your golf game because it helps you enter the mental states that are required for the best shots,” she said.

Garten predicts the headset will eventually become as small as a wireless bluetooth device and the technology will be available in big-box stores, like Best Buy, within two years.

Rod Jones, director-general of the Ontario Aerospace Council, can see the hi-tech equipment being put to use in the airline industry.

He says an online U.S. survey of 500 business and leisure air travellers done for the council in March indicated that they were wanted a more enjoyable in-flight experience.

Surprisingly, the survey appeared to suggest that even 40 per cent of business-class travellers complained of boredom during their in-flight experience.

“Relaxation and entertainment aspects were what InteraXon have focused on,” Jones said, noting that the company had already developed the golf game and relaxation techniques.

Garten said aircraft giants Bombardier and Boeing were recently shown a thought-controlled in-flight entertainment system and “the initial meetings we had were greeted with great enthusiasm.”

But aside from controlling lights and other devices, the 30-year-old psychotherapist says

the process can also be used in to treat children with Attention Deficit Disorder.

It helps them learn how to focus.

“There's a lot of research that shows 10 to 12 one-hour sessions using this system are as effective as Ritalin,” she said.

Garten says it can also help monitor a person's mental state.

“Just like we do heart-monitoring now, for example, brain-monitoring allows you to measures the health and distress of a patient,” she said.

The technology could be used to help monitor motorists on the ground or airline pilots in the skies, Jones said.

“Gauging whether or not they are (alert) is something that would have a very useful application.”

The 15 employees who work at InteraXon include neuroscientists, engineers and industrial designers.

The company website says Garten also ran a successful real estate business and spent time as the designer and owner of a Canadian fashion boutique.

She was a student of Dr. Steve Mann, a University of Toronto professor who initially developed thought-controlled computing technology.

She plays down concerns from people who fret about scary military applications.

Garten prefers to stress the positive side of the technology, like how it could help track the health of soldiers.

“I think people were afraid of most technologies when they first came out, like voice-activated technology,” she added.

“You have to, in some ways, trust in the human spirit and in human ingenuity.”