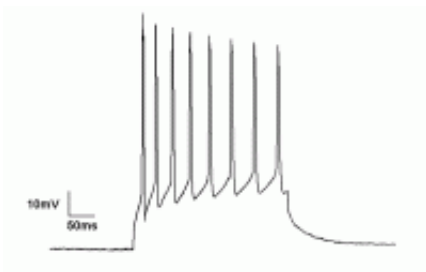


EEG helmet is being developed as interrogation device

July 12 2012, by Nancy Owano



Tonic firing pattern of single neuron showing rhythmic spiking activity. Image: Wikipedia.

(Phys.org) -- Veritas Scientific is working on an EEG helmet that carries a slideshow of images that could, they hope, reliably identify an enemy. The device is shaped like a motorcycle-helmet with metal brush sensors that will read brain activity as images flash quickly across the inside of the visor. Electroencephalography (EEG) is the science of measuring brainwave patterns produced by the brain in response to internal or external stimuli. Familiar images prompt spikes of electrical brain activity that indicate recognition, say scientists.

Fitted tightly to the head without being painful, the helmet is designed to be soundproofed against the outside world. The visor's images are displayed centimeters from the eyes. The metal brush [sensors](#), still in development, are being designed to go easily through hair and conduct brain signals without the conductive gel used in hospitals.

This would be an advantage as traditionally attempts by researchers to use EEG head gear on subjects have drawn uneasy participant experience, as electrodes were glued, pasted or taped to the participant's scalp, Many researchers in the EEG field seek to liberate EEG testing activity out of the lab and into more mobile environments.

Interestingly, the company places its helmet work in the realm of “interrogation technology.”

Veritas Scientific sees its device of use to the U.S. military to help them pick friend from enemy among people they capture. The technology is also suggested as useful for law enforcement.

EEG experiments on mock terrorism plots have been conducted in laboratories; Veritas wants to put its helmets on real suspected terrorists. The company's CEO, Eric Elbot, has described his work as pioneering in the use of brainwaves for interrogation deception detection for the intelligence community. Elbot hopes to have a prototype ready for the U.S. military's war games months from now and is pursuing a military contract.

Veritas draws on the work of J. Peter Rosenfeld, a professor of psychology and neuroscience at Northwestern University. Rosenfeld develops EEG tests that weed out lies. In a past experiment using P300 brain-wave testing in a mock terrorism scenario in which make-believe persons of interest were planning a crime, Northwestern University researchers were able to detect guilty knowledge with 100 percent accuracy with no false positives. “Even when the researchers had no advance details about mock terrorism plans, the technology was still accurate in identifying ten out of 12 terrorists and 20 out of 30 crime-related details,” Rosenfeld said. “The test was 83 percent accurate in predicting concealed knowledge, suggesting that our complex protocol could identify future terrorist activity.” With electrodes attached to their

scalps, connected to an [EEG](#) machine, they looked at a computer display monitor that presented names of stimuli. The names of Boston, Houston, New York, Chicago and Phoenix were shuffled and presented at random. The city that study participants chose for the major terrorist attack evoked the largest “P300” brainwave responses.

As for worries about the use of an “interrogation technology” being wrong when a person’s life is at stake, the company notes that its helmet is still being tested. In a [report in *IEEE Spectrum*](#), Veritas Scientific emphasized its devotion to “extremely high” accuracy.

Also, said a Veritas Scientific source, the device is intended to be one of other factors used and decisions would be left to humans, not machines. Peter Lauro, head of Veritas’s neuroscience h, said that the company continues to examine the right combination of ERPs (event-related potentials), questions, and image patterns for a reliable deception test.

As work continues, they plan to add functional near-infrared imaging (fNIRs) to the helmet. This is a brain imaging technology that measures blood flow.

More information: www.veritasscientific.com/

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