

Research Gives New Perspective On Brain Activities

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(PhysOrg.com) -- University of Victoria (Canada) researcher Phil Zeman has developed a new and less expensive procedure for analyzing EEG (electroencephalogram) data that identifies the location of special brain activities.

Traditionally, it is [functional Magnetic Resonance Imaging](#) (fMRI) that is used to identify which areas of the brain are active during different mental states. Zeman's technology is an inexpensive alternative to fMRI—\$100,000 versus several million dollars. It also requires little maintenance and can be used in an ordinary laboratory or office.

The EEG analysis tool is called “Multiple Origin Spatio-Temporal modeling of EEG” (MOST-EEG). The UVic invention uses the electrical activity obtained from a person's scalp, recorded while she or he plays a video game for example, to construct a meaningful representation of the brain activity that takes place while a person learns and uses the layout of the virtual environment. The tool provides a 3-D representation of brain activity during different mental states.

The procedure could be used to identify areas of the brain that aren't working properly or aren't communicating well to other areas. It also has the potential to track brain changes underlying the kind of neuroplasticity—the capacity of the nervous system to modify its organization—that may be a factor in recovery from stroke and [brain injury](#).

“The MOST-EEG methodology is still being tested and evaluated,” says Zeman, a recent UVic interdisciplinary grad who completed the research as part of his doctoral thesis. “[Brain activity](#) and EEG are complex and variable. Hence, the MOST-EEG needs to be examined in many contexts with this complexity and variability in mind.”

Zeman, his supervisor Dr. Ron Skelton, and PhD student Sharon Lee are currently using the method to analyze data collected in a study to understand how people find their way around in the world and why people with brain injuries have difficulty.

“This study provides an opportunity to obtain additional evidence, beyond what is in my dissertation, showing successful application of the MOST-EEG technique,” says Zeman.

Provided by University of Victoria

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