



Brain Fingerprinting

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Opinion

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Another scientific method that has assisted police investigations since the early 1990s is brain fingerprinting. This was developed by Dr. Lawrence Farwell, a neuroscientist.

Dhiraj Ahuja and Bharat Singh from YMCA University of Science and Technology in India published a paper titled "Brain Fingerprinting" in 2012. The researchers presented the history, definitions, and concepts of this technology. They described the process invented by Dr. Farwell: A small cap-like device is worn on the subject's head and connected to a computer to read his or her brain waves. The device reacts to a unique brain wave pattern when it encounters a familiar stimulus [1]. When the subject who is hooked up to the machine is asked a question, the device focuses on the remembrance or familiarity of an item, object, location, scene, occurrence, or person based on the brain wave pattern and sends a signal wave pattern to demonstrate knowledge of the investigation.

As the experts noted, there are four steps in the brain fingerprinting process: brain fingerprinting crime scene evidence collection, brain fingerprinting brain evidence collection, brain fingerprinting computer evidence analysis, and brain fingerprinting scientific results. The researchers argued that there are some problems with this technology, as it only measures and detects activities or provides knowledge about what is being investigated. It does not detect "intent," and intent is what is mostly needed to prove certain crimes.

The results of brain fingerprinting may prove that the subject was at the scene. However, the results do not prove that the same subject committed the offense. He or she could also be a witness or a victim.

Finer details and specifics could be asked of a subject in order to better ascertain his or her type of involvement in the incident. For instance, Dr. Farwell used the device in 1999 to assist police in investigating a sexual assault and murder involving suspect James Grinder. Grinder was allegedly accused of raping and killing a 25-year-old female victim.

Using the brain fingerprinting test, Dr. Farwell was able to measure the brain waves of James Grinder and determine that he had knowledge of the crime scene and crime itself. Grinder was asked specific questions about the incident that no one would know except the victim and the perpetrator. He confessed to the crime several days after the brain fingerprinting.

According to Ahuja and Singh, there are seven major limitations with this type of technology. The first is that the device only detects what information is in the subject's brain, not how it got there. Second, it only detects information and not "intent." Third, it cannot be used for general screening. Fourth, the device detects information but cannot identify lies. Fifth, it depends on the subject's memory. And sixth, it only depicts the information that is included in the probe stimuli-questions asked. Last, it is no substitute for common sense or good judgement investigation [1].

Dr. Lawrence Farwell, et al. [2]. Richardson also contributed an informative paper on this topic in 2012, entitled "Brain Fingerprinting Field Studies Comparing P300-Mermer and P300 Brainwave Responses in the Detection of Concealed Information." As they described brain fingerprinting, it simply detects concealed information stored in the brain by measuring brainwave responses. The researchers studied behaviors in 76 people, across four types of people who have experiences with the following real-life events: felony crimes, real crimes with real consequences, knowledge unique to FBI agents, and specialized expertise such as explosive (EOD/IED) devices.

The results of the tests were stunning, as they yielded little or no errors, specifically noting that accuracy, validity, and reliability depend on following the methods outlined in the discussed study. The results of the study demonstrated the accuracy of the device in detecting knowledge of the various individuals and their connections to what was being explored. Cases where there were deliberate experiments

to determine memory and knowledge of incidents were positive wherein the participants' brain memory signals proved that they had knowledge of certain events. Also, individuals who had no knowledge of certain incidents had no brain memory activities, thus showing that the tests were primarily accurate.

It is speculated that some agencies at the local, state, and federal levels have examined brain fingerprinting, some have used it, and some are piloting it today. Brain fingerprinting has been piloted by several federal agencies, including the FBI, CIA, DOD, and Secret Service. However, it was stated that they found limited applicability for their daily duties and responsibilities [3]. Clearly, more experience with brain fingerprinting is needed in order to best determine its usage in law enforcement. Is this new forensic technology accurate? Is it usable? Is it relevant to the new age of law enforcement

and crime detection? These are all important questions to be noted and addressed as forensic crime detection evolves.

References

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