



*Jill C. Fike*  
*Director*

*Brian Scott Johnson*  
*Deputy Director*

*Senate Research Office*  
*204 Paul D. Coverdell Legislative Office Building*  
*18 Capitol Square*  
*Atlanta, Georgia 30334*

*Telephone*  
*404.656.0015*

*Fax*  
*404.657.0929*

**FINAL REPORT**  
**OF THE**  
**SENATE STUDY COMMITTEE ON THE USE OF**  
**BRAIN FINGERPRINTING TECHNOLOGY**

**2007**

**SENATE MEMBERS**

**Honorable John Douglas, Chairman**  
**17<sup>th</sup> District**

**Honorable Jeff Chapman**  
**3<sup>rd</sup> District**

**Honorable Nancy Schaefer**  
**50<sup>th</sup> District**

**Honorable Cecil Staton**  
**18<sup>th</sup> District**

**Honorable Doug Stoner**  
**6<sup>th</sup> District**

Prepared by the  
Senate Research Office

## INTRODUCTION

The Senate Study Committee on the Use of Brain Fingerprinting Technology was created by Senate Resolution 593 during the 2007 Legislative Session. The purpose of the study committee was to determine the overall efficacy of using brain fingerprinting as a crime-fighting tool in Georgia. Brain fingerprinting is a new technology that uses brainwaves rather than physical cues to recognize the presence, or lack thereof, of specific and crucial information.

Senator John Douglas of the 17<sup>th</sup> chaired the study committee, and held five meetings across the state. The other members of the committee were Senator Jeff Chapman of the 3<sup>rd</sup>, Senator Nancy Schaefer of the 50<sup>th</sup>, Senator Cecil Staton of the 18<sup>th</sup> and Senator Doug Stoner of the 6<sup>th</sup>.

## BACKGROUND

Neuroscientist Dr. Lawrence Farwell invented brain fingerprinting based on the idea that every criminal case turns up specific details that only investigators and the guilty party know. Brain fingerprinting then uses these details to identify the correct suspect. When the brain recognizes a word, picture, or other type of cue, the brain gives an automatic recognition response, called a P300 response. This response is an almost instantaneous reflex, and there is no known way to alter one's brainwaves.

Currently, Georgia law enforcement relies on traditional techniques to discover whether a suspect has guilty knowledge, such as interrogation, polygraph testing, and DNA analysis. Although brain fingerprinting would not completely usurp the importance of these methods of criminal investigation, proponents of the new technology propose that it will dramatically improve law enforcement efficiency in finding the guilty party.

Thus far, no state law enforcement agency has invested in brain fingerprinting; Georgia would be the first to do so. In fact, only one judge has allowed the introduction of brain fingerprinting evidence. In Terry Harrington v. State of Iowa, Case No. PCCV 073247(Iowa Dist. Ct. Mar. 5, 2001), the district court judge held that the P300 brain response was admissible in court as scientific evidence. The judge also noted that brain fingerprinting had received a mixture of support and skepticism from the scientific community. Unfortunately, the Harrington case remains the only courtroom instance in which brain fingerprinting has been recognized as scientifically viable from an evidentiary perspective.

## STUDY COMMITTEE MEETINGS

Chairman Douglas convened the first meeting of the study committee in his Henry County district on August 24, 2007. Mr. Ernie Robson, president of Brain Fingerprinting Laboratories, introduced the technology as a tool to help law enforcement do its job better. A brain fingerprinting test is simple to administer, in addition to being non-intrusive. The test subject wears a headband designed to record his or her reaction to stimuli, and sits in front of a computer screen that flashes information. The testing process involves taking a baseline reading by asking questions to which the answers are "known," such as name, address, etc. Then the test administrator asks questions about details of a crime to see whether the brain produces the telltale recognition response.

Mr. Robson described the advantages of brain fingerprinting as opposed to current technologies. Polygraph testing is based on whether the suspect is nervous using physical cues, such as sweat

and heart rate, and is not admissible in court. Brain fingerprinting tests the central nervous system for the absence or presence of guilty knowledge, and has been admitted as scientific evidence using the Daubert standard in the Harrington case. DNA testing, while highly accurate, takes weeks to complete. Brain fingerprinting results can be completed on the same day that the test is performed, with comparable accuracy so far.

There are several known limitations on the technology. Most importantly, brain fingerprinting is not an open-ended process; the administrator must test for specific details and facts in order for the system to work. In other words, the test is useful in determining the presence or absence of certain information, but it cannot read minds. Additionally, the test subject must cooperate with the administrator, because the process requires the subject to sit before a computer screen and actively pay attention to the information displayed. Therefore, an extremely tired test subject will not be able to successfully complete the testing process.

From a courtroom perspective, another issue with the admission of brain fingerprinting evidence is constitutional: every criminal defendant has the 5<sup>th</sup> Amendment right not to be compelled to testify against himself, to avoid self-incrimination. It is crucial that a defendant's constitutional rights be respected at every point in a criminal trial process in order to avoid a later challenge to the trial court decision, in the form of a lengthy and expensive appeal. Unfortunately, the brain fingerprinting technology is so new that the courts have not established a uniform procedure for the admissibility of such evidence. However, it is important to note that the testing is completely voluntary, and an uncooperative test subject will nullify the results.

There are also cost and training issues associated with this technology. The test administrator must be extensively trained in order to correctly interpret the results of the procedure, which consist of brainwaves displayed on a graph. The testing is expensive because it is a newly patented technology that only one company, Brain Fingerprinting Laboratories, has the legal right to administer. According to Mr. Robson, costs will vary depending on the case, but the general rate will be from \$20,000 to \$30,000. It is important to note, however, that much of the cost will be legal fees required to ensure this technology is admitted in court, which requires expert witnesses.

The inventor of brain fingerprinting, Dr. Farwell, was present at each of the remaining four study committee meetings. He testified that, although brain fingerprinting has not been formally adopted by any state thus far, his technology is being used by law enforcement at both the federal level and in individual police departments across the country. Dr. Farwell could not share specific information due to national security concerns, but he has met with President George Bush concerning the possible application of brain fingerprinting for homeland security and counter-terrorism purposes. After September 11, 2001, there was a major effort by the federal government to look into brain fingerprinting more thoroughly. Also, the police department in Alexandria, Virginia, successfully utilized brain fingerprinting during an internal affairs investigation involving narcotics and corruption. In other words, brain fingerprinting has proven useful on a case-by-case basis, but has yet to be put to widespread use.

Inspector Rusty Andrews of the Georgia Bureau of Investigation (GBI) testified that colleague Dr. Drew Richardson gave a presentation on the technology for GBI in 2006, and that it seems like a useful tool for law enforcement. However, it is not cost-efficient; last year the quoted price was \$250,000 plus training costs. The GBI does not have the budget to use this technology. The GBI would prefer to allocate money to more tried and true technology until such time that brain fingerprinting is better received in the law enforcement community.

Chairman Douglas expressed concern about the GBI's unwillingness to use such a promising new technology, especially considering that the prevailing method for determining whether a suspect is telling the truth, polygraph testing, is notoriously unreliable and inadmissible in court. Mr. Andrews stated that the main issue is cost; if the General Assembly is willing to pay for the costs associated with brain fingerprinting, then the GBI will cooperate. However, he does not want Georgia to be used as a testing ground for this technology.

Mr. Andrews presented an October 2001 U.S. General Accountability Office (GAO) report to the study committee, which contains conclusions that brain fingerprinting has limited applicability in the real world. The official position of the GBI is that this technology will not be useful in any application, and they are not willing to put forth resources and manpower without more unbiased evidence that this technology will work.

Dr. Farwell acknowledged that brain fingerprinting is not useful for general screening, but rather for specific cases since new probes and questions need to be established for each suspect. However, he emphasized that the GAO report was completed before September 11, 2001. Since then, homeland security has become a foremost concern for the federal government, and brain fingerprinting is likely to be highly effective in that area. There is a new GAO report in progress, but findings have not been released. Dr. Farwell stated that, despite some criticism of brain fingerprinting as having insufficient supporting scientific evidence, no one claims that the science is faulty or that the test is ineffective.

Dr. Bill Iacono, a psychophysiology expert, testified about his confidence in brain fingerprinting. He was one of the expert witnesses in support of the technology in the Harrington case, and he specializes in law enforcement detection technology. Senator Staton asked whether there was any way to manipulate the test in order to give a false reading. There is a possibility that someone could learn a way to beat the test, but the nature of the test would make it simple for such efforts to be detected. To defeat the test, the subject would have to make the brain response to irrelevant stimuli react and give them significance. However, such efforts would affect reaction time and generate errors, rendering the test invalid.

Chairman Douglas asked Dr. Iacono to compare brain fingerprinting with polygraph testing. One of the features of brain fingerprinting is that research indicates the test taps into memory. Polygraph is affected by many things, like emotion. Also, there is no scientific theory to explain why polygraph testing works. There is a solid scientific theory behind brain fingerprinting. In order to manipulate brain fingerprinting, the subject would have to learn how to control his or her recognition response, which would be very difficult.

Senator Staton asked about the difficulty of training law enforcement personnel sufficiently so that they may administer brain fingerprinting tests without the presence of Dr. Farwell or a member of his team. Right now it would be difficult because there is no template in place to standardize the training. The most difficult part of the test is coming up with useful probes or questions in individual cases. Once the probes are established, the computer does all the work. Before the test is administered, the subject will be asked about all the information in the probes to ensure that he or she does not have a special memory of the event from another instance.

Dr. Drew Richardson testified about his work with FBI trainees using brain fingerprinting. The technology was used to successfully identify which members of a group were FBI agents based on probes and questions pertaining to FBI training. Dr. Richardson expressed his opinion that such a technique could be useful to determine whether a suspect has had terrorism training or is a member of a subversive group, such as Al Qaeda. However, the FBI does not currently use

brain fingerprinting on a regular basis because, according to Dr. Richardson, there is a resistance to change and learn a new technology within the FBI.

At the final study committee meeting, Mr. Robson testified that brain fingerprinting has endured sufficient scientific study and real-world testing to make it ready to use at a statewide level. Unfortunately, there is always resistance to new technology, but Georgia has the chance to be at the cutting edge of criminal justice expertise. There are more than 50,000 people incarcerated in Georgia, and some of them have been wrongly convicted. This technology makes it possible for the justice system to do its job a little better, which will ultimately save money for the state. Another option is to institute a smaller pilot program to allow for further testing.

Director Vernon Keenan reiterated the GBI's position that brain fingerprinting is in the early stages of development, and extensive testing in the field on its validity is necessary before the GBI would consider using it. In order to learn the new technology, busy agents would have to take time away from investigating cases. For example, before a DNA unit was established in Georgia in 1986, extensive testing had been conducted, including pilot programs. The GBI does not want to be placed in the position of convincing judges and juries that a new technology is valid. From a practical perspective, GBI would only use this technology once it is properly vetted at the federal level, as was done for DNA testing and computer forensics. Crime victims do not want to hear that the GBI is using experimental technology on their cases.

Senator Chapman questioned whether the GBI would be willing to re-train a few of its polygraph experts in brain fingerprinting, rather than training every agent. According to Mr. Keenan, polygraphs have been recognized as a law enforcement tool since the 1930s. Approximately 60% of suspects who test "deceptive" with the polygraph later confess to the crime. Polygraph tests are not infallible, but the reality is that the numbers of cases the GBI must handle make the institution of new technology prohibitive. GBI bases its position on the fact that no other law enforcement agency uses brain fingerprinting on a routine basis; until then, the GBI does not want to adopt it. The GBI only wants to devote its limited resources to established technologies.

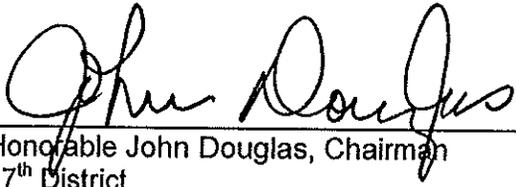
Cobb County District Attorney Pat Head testified that the admissibility of evidence lies solely with judges, and will therefore be unpredictable until a technology such as brain fingerprinting has been solidly accepted by the scientific community. Brain fingerprinting appears to be reliable, but it has not been fully investigated in all types of cases.

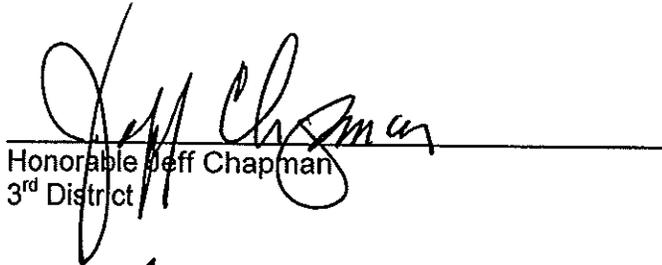
## **RECOMMENDATIONS**

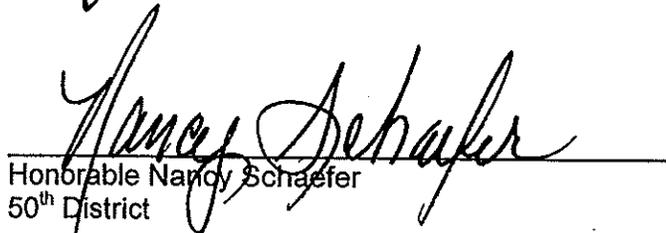
Following the close of testimony, Chairman Douglas asked for the impressions of the study committee members. Senator Chapman stated that brain fingerprinting could evince the same results as polygraphs in terms of calling a suspect's bluff and getting a confession. He would like to give this technology serious consideration without hampering the GBI. Senator Schaefer is confident that the day will come for brain fingerprinting. However, the GBI is currently ill-equipped to take on any new technology. The committee should not waste the knowledge it has gained; she would like to make recommendations to the correct agency.

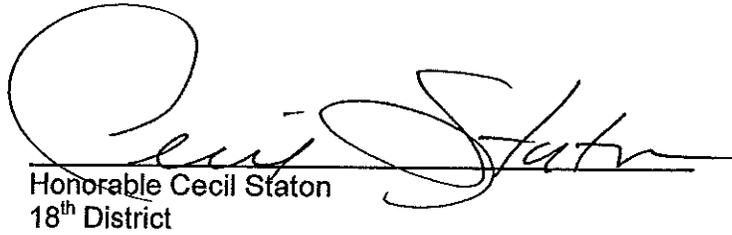
The study committee concludes that law enforcement agencies in Georgia, including the GBI and Georgia State Patrol, should further investigate brain fingerprinting technology and determine whether the technology is useful in both economical and practical terms. Should these state level agencies determine that the people of Georgia would benefit from establishing brain fingerprinting as a law enforcement tool, the agencies should approach the budget process with a request for appropriate funding to purchase and begin regular use of the application.

Respectfully Submitted,

  
Honorable John Douglas, Chairman  
17<sup>th</sup> District

  
Honorable Jeff Chapman  
3<sup>rd</sup> District

  
Honorable Nancy Schaefer  
50<sup>th</sup> District

  
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