



# DATA SCIENCE & ARTIFICIAL INTELLIGENCE INITIATIVE WORKSHOP ON ADJUDICATION OF AI

Neurotechnologies, Brain Function & Cognition Evidence

Use case submitted by Judge Michael Pietruszka (Ret.)



National Courts and Sciences Institute



State Justice Institute

Mary Stevenson, a digital game designer at DigiFun, Inc. alleges that an accident at her workplace, caused by faulty hardware produced by LifeTech, Ltd. to increase productivity, resulted in a traumatic brain injury (TBI). Mary was working in close proximity to a high-performance server rack system that had recently been installed by LifeTech, Ltd. to enhance data processing speed and efficiency in the game development studio. The server rack, designed to be highly efficient, malfunctioned due to a defect in its cooling system. The malfunction caused an overheating issue, leading to an unexpected explosion of one of the server units.

The explosion caused heavy metal components and debris to be ejected forcefully. A significant piece of metal struck Mary on the head, resulting in immediate unconsciousness. Colleagues quickly called emergency services, and Mary was transported to the hospital. Initial assessments suggested severe head trauma with potential brain injury.

Upon arrival at the hospital, Mary underwent a series of diagnostic tests, including CT scans and MRIs, to assess the extent of her injuries. The findings included Cerebral Contusions, Diffuse Axonal Injury (DAI) and Subdural Hematoma.

Mary claims that the injury has led to cognitive impairments, including memory loss, reduced concentration, and emotional instability, severely impacting her ability to work and her quality of life.

Mary engaged counsel. To support her case, Mary's legal team presents evidence from a series of AI-enhanced fMRI scans. These scans, analyzed by a state-of-the-art AI system called BrainAtlas, map brain activity and identify regions affected by the injury. BrainAtlas uses machine learning algorithms to compare Mary's brain activity with a vast database of healthy and injured brains, highlighting abnormalities consistent with TBI.

In an attempt to address her cognitive impairments, Mary contacts MindTech, Inc., whose flagship product, BrainBoost, is an AI-powered neural interface which can seamlessly integrate with the human brain to monitor and stimulate neural activity in real-time using Transcranial Magnetic Stimulation (TMS). It is designed to improve cognitive functions such as memory, focus, and learning ability. TMS uses magnetic fields to stimulate nerve cells in the brain non-invasively. The treatment involves placing an electromagnetic coil against the scalp to deliver magnetic pulses that modulate neural activity. Cognitive and behavioral assessments are conducted to measure the effectiveness of TMS in improving cognitive functions. Neuroimaging techniques such as fMRI can be used to observe changes in brain activity and connectivity.

BrainBoost uses AI in data analysis and customization, including real-time monitoring (continuous monitoring of the patient's brain activity, analyzing data from the TMS sessions), adaptive stimulation (use of machine learning algorithms to interpret the data and adjust stimulation parameters in real-time, ensuring personalized treatment and optimizing neural pathways based on the patient's unique brain activity patterns) and outcome optimization (assisting in predicting the most effective stimulation settings, reducing trial-and-error in treatment adjustments and enhancing overall therapeutic outcomes).

The TMS therapy was administered in a clinical setting at Tonawanda Community Hospital by Dr. Johan Schmidt, a neurologist trained in TMS therapy. However, she alleges that the therapy, due to a software malfunction, overstimulated certain brain regions, leading to seizures, impulsivity, insomnia, and heightened anxiety and stress responses.

Mary also claims that the TMS device collected and transmitted sensitive neural data without her explicit consent, violating her privacy. Mary's legal team expanded the scope of their representation.



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*Who should be the defendants in Mary's lawsuit?*

*What allegations should be made in the Complaint against each defendant?*

*What theories of recovery underlie each allegation?*

*Would you order the hearing?*

*What evidence would you require?*

*At that hearing, would you require expert testimony?*

*What type of experts would you want to testify at the hearing?*

*How would you rule on the motion?*

*What would be the basis of your ruling?*

*If her lawsuit is successful, what is the measure of Mary's damages?*