

Neurology and Neurological Disorders

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Turning Stress into focus with Soundscaping


Stress is the generic term for a subjective cognitive experience, and a psychological and physiological synthesized state generates under a variety of perceptions, thoughts, and behaviors, and environmental factors. In general, stress responses can be categorized into Angry, Protected, Sad, Surprised, Fear, and Unconcerned, 6 types of negative emotions. Stress is often created under the influence of mood, personality, temperament, purpose, and environmental factors. It can also be affected by hormones and neuro transmitters. While stress can have many trigger, events caused by personal and environmental factors, focus is the result of motivation working in harmony with the environment. Although some stress related emotional behavior appears take place inadvertently, conscious reactions to environmental stimuli plays an important role in producing stress reactions. A focused state is where emotions are suppressed to allow a task or multiple tasks to be performed. In a focused state the brain works in harmony with the environment, instead of reacting to it. This paper from the perspective of cognitive neuroscience investigates difference of human brainwave of 6 types of stress triggered emotions i.e. Angry, Protected, Sad, Surprised, Fear, and Unconcerned. The experiment uses

acoustic stimuli to initiate the transition between a stressed state and a focused state in the test subjects. Electroencephalogram (EEG) hardware and software is used to extract frontal lobe brainwaves. The extracted brainwaves are further transformed into frequency domain signal where sub-band energy is calculated, characterized, and finally digitally encoded for analysis. The encoded characteristic brainwaves for stress reactions are compared for their difference. Audio induced transitional waveforms that indicate a focused state, can be effectively identified by the proposed emotional brainwave digital encoding technique.

Speaker Biography

Robert L Burton has received BS in Biochemistry and Mathematics from Georgetown University Washington D.C. in 1974 and his M.D. and Ph.D. in Physical Quantum Biochemistry in 1978 from George Washington University in 1978. He has done residency for internal medicine at Saint Francis Hospital University of Hawaii, and Case Western University Cleveland Ohio, where he also received the Liliha Cancer research grant, for work on estrogen receptor detection with radio immune assay. He did his subspecialty in Oncology and Pediatrics at Georgetown University and has received a Sc.D. in Bioengineering at George Washington University in 1985. He has done research with N.A.S.A. in the pathfinder program and helped design a biochemical analysis package for the Mars Rover. He was in private practice for 15 years, then worked at University of Chicago Hospitals. He supposedly retired to Carmel California and then found a great position at Plantronics Inc. Where he is one of the 2 medical doctors working on innovations in the wireless industry.

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