The Mapping of Emotional Dimensions: Toward a Neuro-Thermal Biometric System for the Diagnosis of Emotional Flexibility

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Emotions may become inappropriate, excessive, and even pathological, such as in major depressive disorders, with disabling and costly consequences of emotional dysfunction. The skill to successfully respond and adapt to changing emotional circumstances is called emotional flexibility. In this research study, a mathematical correlation between the Fractal Dimension (FD) of audio stimuli and the selective emotions induced was found. The ability to trigger emotional states using audio-stimuli, with designed dynamic dimensionalities (dFD/dt not = 0) while understanding the asymmetries and lateralization of the brain's electrical activity, was used to identify and visualize Emotional Flexibility. Left and right hemisphere prefrontal cortexes are involved in processing and regulating emotional responses induced by the experimental music/sound clips. The selective lateralization was consistent with the temporal dimensionality regions of the audio stimuli and the intensities are proportional to the magnitude of dFD/dt. On the basis of these findings, the prediction of flexible emotional responses is relative to the dynamics of the residual electrical activity of the previous emotional state. This discovery has a significant impact in the area of neuro-scientific social interactions and it could be used as a potential treatment for the symptoms of mood disorders, neurological disorders, and anxiety disorders such as Post Traumatic Stress Disorder (PTSD). This protocol is faster, more accurate, and more reliable in comparison to current methodologies.

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