

Software Controlled Lighting: Auditory-to-Visual Sensory Substitution

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Abstract

It is all too common for individuals with hearing impairments to be confronted by strategic disadvantage while playing video games due to a lack of accessibility features. Modern neuroscience study of the brain indicates visual and auditory cortices possess overlapping receptive fields. Furthermore, studies of cortical plasticity have shown, despite partial damage to the primary auditory cortex, receptive fields in other regions of the cortex are multimodal and respond to inputs from more than one sensory modality. This project takes advantage of Donald Hebb's rule that, "neurons that fire together, wire together" by strengthening connections between neighboring cortical neurons through means of auditory to visual sensory substitution. By embracing well-known principles of neuroscience the project intends to use software controlled lighting to provide an augmented and more accessible experience for all players.