

# **Exergames: Developing Sensory Substitution utilizing Enhanced Auditory and Vibrotactile Cues**

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## **Abstract**

A problem that faces children and teenagers who are disabled is that they are unable to have the same experiences as their peers through gaming. Although most commercial games offer certain accessibility features, such as a screen reader, color contrast, or the ability to change button assignment, these are only a few of the necessary steps needed to be taken to allow all persons with varying disabilities to have an enjoyable experience. However, recent techniques have involved supporting both controllers with vibration and standard keyboards, allowing for non-visual interaction as well as ease of use for 3<sup>rd</sup> party controllers designed for people with motor impairments. To further research in this area, we have created three Open Accessible (OA) games to continue development of new sensory substitution techniques: OS Tennis, OA Dash, and OA Dance. These games combine various technologies using enhanced vibrotactile and auditory cues to allow visual or hearing impaired persons to play the game. A developer can, however, modify the game to meet the needs of an individual person, allowing them to be universally accessible for all people. We believe that these games can help lower the barriers people with disabilities face and promote overall well-being.