A Tangible Interface System for People with Down Syndrome

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Abstract

In general, people with Down syndrome have cognitive limitations and motor difficulties that may compromise the individual's development throughout life. It is due to the genetic condition that imposes peculiarities, such as low muscle tone and difficulty in learning, making it difficult to understand and interact with and around the environment. However, the use of new technologies proves to be a promising route because it offers new stimuli that can be used as reinforcers in rehabilitation, training, and entertainment activities. An example is a provision and use of systems with tangible interfaces, whose interaction between the user and the machine happens through touch. It promotes proprioception, incites attention, interest, and concentration. This work describes the development and evaluation of a computational system with a tangible interface, called 3D Sandplay. This system offers a sandbox, which enables user interaction with the virtual world, amplified by Augmented Reality, for creating scenarios and understanding abstract concepts. 3D Sandplay was evaluated by a group of people with Down
syndrome in three distinct activities and, in addition to achieving the events, the interest, attention, and resistance to complete the activities were evaluated. All research volunteers are students of the Alfadown project, an extension project maintained by PUC Goiás. Results have shown that 3D Sandplay is a tool that can contribute to the cognitive and motor development of children, adolescents, and adults with Down syndrome.

References


Index Terms

Computer Science, Information Systems

Keywords
Down Syndrome, Tangible Interface, Augmented Reality.