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A review of computer-based gesture interaction methods for supporting disabled people with special needs (Conference Paper)

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Abstract

Gesture interaction is currently a very emerging field in computer science and engineering. This is since it is able to allow humans to communicate interactively with the machine via numerical linear algebra and mathematical techniques. In this paper, we discuss various modern state-of-the-art techniques the academic researchers including the author have attempted in recent years in order to achieve the gesture recognition and interaction in a robust way interactively. This paper is divided into three main parts. First, we introduce hand gesture recognition and body gesture recognition for general purposes using computer vision technology. These include a fast learning mechanism from an accurate sixdegrees- of-freedom pose tracker, a real-time extended distance transform for the hand model, and a robust integration of support vector machine and superpixels. Second, recent gesture interaction methods, more specifically, for helping disabled people with special needs are reviewed using human-computer interaction and sensor technology. These methods include combinatorial approach recognizer (CAR), hand skeleton recognizer (HSR) and Viewpoint Feature Histogram (VFH). Third, we discuss the advantages and disadvantages of the aforementioned gesture interaction methods. By understanding the state-of-the-art approaches for computer-based gesture interaction presented recently by leading researchers, this would advance beneficially the interactions that persons with disabilities would conveniently, practically and easily have with modern recognition technology. © Springer International Publishing Switzerland 2016.

Author keywords

Computer vision; Gesture interaction; Gesture recognition; Interface; Physical disabled people; Sensor technology; Wearable computing

Indexed keywords

Engineering controlled terms: Computer vision; Gesture recognition; Interfaces (materials); Linear algebra; Palmprint recognition; Wearable sensors; Wearable technology

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