

Comparison of a Video and a Virtual Based Environment Using the Temporal and Spatial Occlusion Technique for Studying Anticipation in Karate

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Abstract

Perception and anticipation are important determinants in karate sports. Using the temporal and spatial occlusion technique in video presentations is a common method to determine anticipatory cues but the lack of information about depth in video presentations seems to affect the results. The aim of this study is to compare the responses of karate athletes to occluded attacks shown on a video screen and in a virtual environment. Five expert karate athletes were filmed by two synchronized high-speed cameras while responding to nine temporally and spatially occluded sequences of a competition relevant attack at first in a CAVE (Cave Automatic Virtual Environment) and then on a life-size video screen. Their responses were rated as 'correct' or 'incorrect'. The results of the Wilcoxon test show significant differences ($Z = -2.325$, $p < .05$) in regard to the number of 'correct' responses for these scenarios. It is concluded that the higher number of 'correct' responses in the virtual environment is caused by depth information, which evokes a more realistic feeling about the environment and is therefore seen as more beneficial for research of anticipation. Also, first anticipatory cues based on the results of the virtual environment could be determined.

KEYWORDS: ANTICIPATION, KARATE, OCCLUSION, VIRTUAL REALITY