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Analysing Responses of Intermediate and Expert Karate Athletes towards the Gyaku-Zuki Using Virtual Reality

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Abstract : Karate-kumite is a fast sport where a good perception and anticipation of movements is needed in order to respond appropriately. Perception and anticipation are therefore essential for an efficient and precise movement control and a limiting factor in karate kumite. Previous studies only used 2D video technologies combined with the occlusion technique to study anticipation in sports. These studies showed limitations in the usage of 2D video footage in regards to realism and the presentation of depth information. To overcome these issues a virtual 3D environment was developed to create a similar to real life environment. The aim of this study was to compare the differences in responses of intermediate and expert karate athletes towards temporally and spatially occluded virtual karate attacks from two attackers. Five male expert and five intermediate karate athletes responded physically to nine (3 temporal combined with 3 spatial) occluded attacks of the Gyaku-Zuki of each attacker in the 3D virtual environment. The responses were evaluated in regards to correct point of time and appropriate response technique. Significant differences between the expertises' responses for the attackers were found. Experts respond more often correct to early information of attacks than novices.

Keywords : anticipation, karate, occlusion, virtual reality
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