

## **Detecting Body Movement Patterns Resulting in Deceptive Behavior in a Virtual Reality Throwing Task**

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The perception of human kinematics conveys enough information for the observer to successfully recognize the coordinated patterns of body movement and subsequently predict the intended outcome of the observed motion. However, altering some of the movement patterns can affect prediction of the action drastically, resulting in what is commonly known as a deceptive movement. In a preliminary study we have set up a virtual environment where we could observe the effects of such changes to the movement patterns in ball throwing that eventually lead to a deceptive motion. Preparation of the stimuli for the study consisted of recording number of genuine throws on various target locations that were performed by human subjects. These movements were retargeted on a virtual reality character and presented as genuine throws. Using the movement of genuine throws, deceptive throws were realized by morphing the head movement from one and rest of the body movement from another genuine throw. Participants were then presented with a mixture of genuine and deceptive throws by a character in virtual reality environment and attempted to catch the virtual ball thrown by the character. Our results indicate that participants were successful at intercepting the ball in both genuine and deceptive scenarios. However, the analysis of difference between the onset direction of the arm movement, reaction time and accuracy of the movement in response to the genuine and deceptive throws did not yield any conclusive results and further testing is necessary. Additionally, the study has identified the necessity of improving the “presence” in the virtual environment.