

Upcoming Fight Simulation with Smart Shadow

Authors : Ramiz Kuliev, Fuad Kuliev-Smirnov

Abstract : The 'Shadow Sparring' training exercise is widely used in the training of boxers and martial artists. The main disadvantage of the usual shadow sparring is that the trainer cannot fully control such training and evaluate its results. During the competition, the athlete, preparing for the upcoming fight, imagines the Shadow (upcoming opponent) in accordance with his own imagination. A 'Smart-Shadow Sparring' (SSS) is an innovative version of the 'Shadow Sparring'. During SSS, the fighter will see the Shadow (virtual opponent that moves, defends, and punches) and understand when he misses the punches from the Shadow. The task of a real athlete is to spar with a virtual one, move around, punch in the direction of unprotected areas of the Shadow and dodge his punches. Moves and punches of Shadow are set up before each training. The system will give the coach full information about virtual sparring: (i) how many and what type of punches has the fighter landed, (ii) accuracy of these punches, (iii) how many and what type of virtual punches (punches of Smart-Shadow) has the fighter missed, etc. SSS will be recorded as animated fighting of two fighters and will help the coach to analyze past training. SSS can be configured to fit the physical and technical characteristics of the next real opponent (size, techniques, speed, missed and landed punches, etc.). This will allow to simulate and rehearse the upcoming fight and improve readiness for the next opponent. For amateur fighters, SSS will be reconfigured several times during a tournament, when the real opponent becomes known. SSS can be used in three versions: (1) Digital Shadow: the athlete will see a Shadow on a monitor (2) VR-Shadow: the athlete will see a Shadow in a VR-glasses (3) Smart Shadow: a Shadow will be controlled by artificial intelligence. These technologies are based on the 'semi-real simulation' method. The technology allows coaches to train athletes remotely. Simulation of different opponents will help the athletes better prepare for competition. Repeat rehearsals of the upcoming fight will help improve results. SSS can improve results in Boxing, Taekwondo, Karate, and Fencing. 41 sets of medals will be awarded in these sports at the 2020 Olympic Games.

Keywords : boxing, combat sports, fight simulation, shadow sparring

Conference Title : ICICBST 2021 : International Conference on Implementation of Computer-Based Sport Training

Conference Location : Tokyo, Japan

Conference Dates : January 07-08, 2021