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AI COACH: LEARNING TABLE TENNIS STRATEGY RULES FROM VIDEO

Abstract

We propose a system for automatically extracting rules of table tennis strategy from video using a clustering method. We analysed videos from women's table tennis singles tournament at the 2016 Rio de Janeiro Olympics, including 16 matches from the third round to the final. This new video corpus contains a total of 407 plays, and 7,434 separate ball trajectories. In this work, we use only a subset of 372 plays and 6,862 ball trajectories, after removing cases where the ball trajectory is occluded by either the players or the coach. The videos in the resulting dataset were processed with a fuzzy clustering algorithm, and results demonstrate that it is possible to characterize players' strategies based on the learned relationship between player characteristics and ball position in image-based coordinates. We discuss the implications of these results toward the design of a system for characterizing player strategy in the form of rules extracted by a fuzzy clustering algorithm, in real time and from video data. Through future work, we hope to integrate this new capability into an "AI strategy coach" that can help improve player strategies.

Key words: *table tennis strategy, image processing, fuzzy clustering method, AI coach*