

Classification of Sequential Sports Using Automata Theory

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Abstract : This paper proposes a categorization of sport that is based on the system of rules that a sport must adhere to. We focus on these systems of rules to examine how a winner is produced in different sports. The rules of a sport dictate the game play and the direction it takes. We propose to break down the game play into events. At this junction, we observe two kinds of events that constitute the game play of a sport -ones that follow sequential logic and ones that do not. Our focus is pertained to sports that are comprised of sequential events. To examine these events further, to understand how a winner emerges, we take the help of finite-state automaton from the theory of computation (Automata theory). We showcase how sequential sports are eligible to be represented as finite state machines. We depict these finite state machines as state diagrams. We examine these state diagrams to observe how a team/player reaches the final states of the sport, with a special focus on one final state -the final state which determines the winner. This exercise has been carried out for the following sports: Hurdles, Track, Shot Put, Long Jump, Bowling, Badminton, Pacman and Weightlifting (Snatch). Based on our observations of how this final state of winning is achieved, we propose a categorization of sports.

Keywords : sport classification, sport modelling, ontology, automata theory

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