Chapter 1
A Review on Sports Engineering and Technology

G Prasad
https://orcid.org/0000-0002-5709-9182
Chandigarh University, Punjab, India

Mehwish Akram
Chandigarh University, Punjab, India

Shan Hasan Khan
https://orcid.org/0009-0009-4080-6854
Chandigarh University, Punjab, India

ABSTRACT

Sports engineering and technology have been essential in transforming athletic performance, equipment design, injury prevention, and spectator engagement. This paper examines the interdisciplinary advancements that merge engineering principles with sports science to improve both elite and casual sports experiences. Significant advancements encompass improvements in materials science for equipment enhancement, biomechanics for performance evaluation, wearable technology for instantaneous monitoring, and data analytics for informed decision-making. Moreover, nascent technologies like artificial intelligence, machine learning, and virtual reality are transforming training methodologies and spectator experiences. The assessment underscores the issues associated with ethical considerations, accessibility, and preserving the integrity of competition. This study highlights the essential influence of engineering and technology on the ongoing advancement of sports by analysing present trends.

DOI: 10.4018/979-8-3373-2160-8.ch001

INTRODUCTION

Sports Engineering has paved a path for integrating robotics, mechanics, engineering, aerodynamics into a series of sports. Not just any sports turn into engineering success with more efficiency such as Formula-1 cars, but the gates are opened for especially abled or differently abled beings which assists them to show their talents. Sports engineering have shown great improvements since its introduction. Sports such as Motorsports (F1, MotoGP), Team Sports (Football, Basketball, Cricket), Paralympic sports have shown immense development with the aid of Sports Engineering. Now the deal is how sports engineering proves to be useful in all these sports which will be discussed later in the paper but for now let's have a brief on its methodology. So, coming towards the first and foremost topic of interest for us, Formula-1 which is often compared to aircrafts and are every so often referred as "Jets on Roads". Formula-1 comes closest to achieving the same aerodynamics on the ground what aircrafts achieves above the ground. Next in line would be the most common device that can be found all around, it is the Drones. Drones can be seen everywhere, videography, entertainment, surveillance, inspection, safety etc. Drones have been proved to present with utmost efficiency while documenting numerous sorts such as cricket, tennis, football etc. Contrast to this, multiple other variations can be seen in number of sports which do not only make that game interesting but also allow to learn their body movements, equipment's energy, aerodynamics of the object, etc.