Chapter 2
Review

The initial keyword review used the conference publication "The Engineering of Sport" for 2012 [11]. This fast turn-around publication serves as a 'mark in the sand' of research works that is both early and timely, as a window into the use of sensors. A review of the publication from a decade earlier in 2002 [12] serves to indicate a sense of emerging trends in sensors and their growing popularity. Individual papers were assessed on their use of sensors and are grouped accordingly in the Table 2.1. This broad-brush stroke shows the progressive adoption of sensors into the Sports Engineering discipline showing growth from 42–71 % of paper volume over the last decade. Of the summarised topics the measures of force (direct and indirect), use of sensors in wind tunnels and inertial sensors were the highest areas of paper frequency and will largely be the focus of the review section. We will largely exclude the routine use of video and motion capture systems, with some exceptions.

The primary areas of focus of these sensor related papers included from 2002 were materials, impacts, vibration, fluid dynamics, optimisation, robotics, measurement, motion analysis and biomechanics. In 2012 the primary areas were aerodynamics, biomechanics, footwear, innovation and design, measurement and instrumentation, modeling and simulation, motion analysis, and sports surfaces. Sensor technologies included human electrodes, resistive sensors, distance and height sensors, and optical methods. The review was conducted primarily by sensor technology grouped by sport, and is an imperfect approach, as at times a sport centric approach might seem more appropriate. The forthcoming sections are thus grouped by investigations into force, inertial and other which encompasses optical,

D.A. James and N. Petrone, *Sensors and Wearable Technologies in Sport*,
SpringerBriefs in Applied Sciences and Technology,
DOI 10.1007/978-981-10-0992-1_2

Table 2.1 Sensor use by publication frequency and broad usage classification from the engineering of sport conference series 2012 [11], 2002 [12]

Topic, year	Percent of total (%)	Motion capture	Video	Inertial (Acc/Gyro)	Force, strain, pressure	Wind tunnel applications
2002 (N = 113)	42	9	13	13	11	2
2012 (N = 154)	71	6	29	30	22	23

displacement and techniques that resist easy classification. An introduction to many of the sensors used here, though chiefly in a physiological context was undertaken by Cutmore et al. [13] in 2007.

http://www.springer.com/978-981-10-0991-4

Sensors and Wearable Technologies in Sport
Technologies, Trends and Approaches for Implementation

James, D.A.; Petrone, N.

2016, VII, 49 p. 7 illus., 1 illus. in color., Softcover
ISBN: 978-981-10-0991-4