

Smart-top: Athlete Monitoring for High Impact Sport

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This paper describes the development of "SmartTop"

a wearable device for providing real time information on impact and pressure for high impact sport.

Rugby is a high impact sport where players can wear only a limited amount of protection. It is of high interest to coaching staff to know information about impact made under different tackling methods. There is also potential for live information such as scrum pressure information for television and interactive media. As part of the Dunedin Industrial IT project, the authors (and many others) are working on an application to provide live information from rugby players. This application presents a number of unique problems mainly as a result of the very physical nature of rugby.

Many rugby players use a shoulder protection garment called ShockTop, which is manufactured by Protective Sports Apparel Ltd in Dunedin. For this project, pressure sensors and communications devices are inserted into the article to measure force information.

Thin Force Sensors Resistors (FSR's from Interlink



Figure 1: Sensors and Pad

Electronics (<http://www.interlinkelec.com/>) provide a simple, economical and convenient way of obtaining impact or pressure data. These are used in a number of industries, including health sciences, computers, general industry and clothing. FSR's are ideal for a "Smart Shock Top" application.

Working in with industrial partners and advisors the project team are developing a "Smart Shock Top" prototype using Force Sensors in the shoulder pads of the garment with a wire running down the front of the garment to the waistband of the shorts where a transmitter will send the signal to a computer and then to coaches and potentially to media outlets. It is envisaged the transmitter would be half the size of a matchbox, probably using Bluetooth technology. The prototype has sensing equipment and communicates via an RS232 connection.

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Figure 2: BIT Student (and Otago Player) Warren Matene examines sensor location