



INTELLIGENT KNEESLEEVE

An intelligent fabric joint sleeve for training and rehabilitation of athletes

The Core Technology

The broad (core) technology involves the use of “intelligent” fabrics to provide immediate feedback with respect to human motion for a diverse range of applications. Fabrics are coated with inherently conducting polymers to form strain gauges that can be used as integrated components of clothing and/or items that can be comfortably worn during physical activity.

The Intelligent Kneesleeve: an Application of the Core Technology

Using this technology, the University of Wollongong and CSIRO (Textiles and Fibre Technology) have developed the Intelligent Knee Sleeve - a lightweight fabric sleeve worn around the knee with a specially coated stretchable strip of intelligent fabric, linked to appropriate electronics, attached over the patella (knee cap). The coated fabric acts as a strain gauge, with a wide dynamic range, and emits an audio tone when the knee bends beyond a pre-set angle. If, on landing, the knee angle is sufficient, immediate feedback is provided to the wearer by means of an audio tone. If the wearer does not bend their knee sufficiently they receive immediate feedback by the absence of a “beep”, allowing the player to adjust their landing technique accordingly until they hear the sound.

Teaching players correct landing technique has been identified as a primary preventative strategy to reduce the likelihood of incurring devastating non-contact ACL injuries; injuries which happen when athletes land inappropriately and are common place in many of the most popular participation sports worldwide, such as the football codes, soccer, basketball, and netball.

The Market

The Intelligent Knee Sleeve can be used as a training device to assist in the prevention of injuries to athletes, particularly rupture of the anterior cruciate ligament (ACL), through training athletes to land correctly, especially in sports such as basketball, netball and the football codes where jumping-related knee injuries are common. It can also be used as a rehabilitation device following injury by assisting to retrain patients correct joint movement during treatment.

IP Position

A provisional patent application has proceeded to the PCT stage (August 2002, “Feedback Device” WO 03/014684) in Japan, USA, Korea, Australia and Europe. UOW also has an exclusive licence option to an equivalent granted US patent. UOW’s patent applications protect the concept of using a biomechanical feedback device incorporating a fabric strip sensor to provide immediate feedback to the wearer about their joint motion.

Commercialisation Strategy

We are seeking an early stage investor to fund development of a market-ready kneesleeve product. Subsequent funding will be sought to develop the core technology for other joint applications as well as an intelligent body suit covering multiple joints (could be used for rehabilitation, posture, optimising golf swing etc).

NHMRC funding has already been obtained and was used to fund further development of the intelligent kneesleeve.

MORE INFO:

To discuss your options, contact our Managers of Innovation and Commercialisation (MIC).
Contact details are listed at: www.uow.edu.au/research/mic/staff.html