2010年臺灣國際科學展覽會
優勝作品專輯

國家： New Zealand

編號：100028

作品名稱

A.L.E.R.T

得獎獎項

Engineering Third Award

作者姓名

Liam Ellis

Abstract

My project 'Avert' (To avert and vertebrae combined) involves research into posture related back problems and a solution to help prevent back pain by maintaining correct posture. My solution is a chain-like structure fitted with 24 sensors that is sewn into a Skins compression top. When worn the chain is aligned with the user's spine from the lower back to the base of the neck and moulds to the spine as it moves. As everybody's back is slightly different it is important that the device can recognise the difference between what may be bad posture for one person, yet relatively normal for another. To solve this the device takes an initial reading of the user's spine in correct posture and saves it as a reference measurement. Bad posture is defined by the device as angles that exceed the natural movement of individual vertebrae and their platelets. While in use the 24 sensors are continually measuring the shape of the user's spine and comparing it with the original reference measurement taken earlier. If any measurement links to unhealthy posture a light will flash and an alarm will sound either aloud or through headphones until the posture is corrected. This device can be worn during light activity and non contact sports to encourage the user to maintain correct and healthy posture. The device can also record and save poor posture measurements that can be uploaded later to a software program I designed to draw the shape of the spine as a vector diagram. The device can also be plugged directly into a computer so that the user can see the shape of their spine as it moves in real time. I, along with others, tested my solution with many activities and found Avert to be a beneficial and reliable product as it successfully detects slouching and many potentially problematic spine shapes. Throughout my research I gained a thorough understanding about the potential damage bad posture can cause and the endless number of activities it occurs in. With further development I feel there is a huge potential for Avert to become a marketable product used not only for posture correction in everyday activity, but for many other purposes such as physiotherapy, biomechanics and athletic performance. Many people have approached me with praise and requests for the Avert system which is extremely exciting and also rewarding to know that my research has the potential to help people.