Insight commercial case studies

Sector: **Health**

Insight

Centre for Data Analytics

Measuring Behaviour and Performance with sensors

shimmer™
DISCOVERY IN MOTION

Shimmer is working with Insight to enhance the capability of a multi-sensor platform to capture objective measures of human behaviour and performance in Sport and Health

Executive Summary

Challenges

Shimmer is the leading provider of wearable wireless sensing systems and technologies. The primary challenge was to understand the role/impact that harvesting data from Shimmer's multi-sensor management system has in the area of human performance, in particular healthcare and elite sports:

- **Validation of a novel sensor for ambulatory measurement of heart rate**
- **Strategies for measurement of motor behaviour across a person's lifespan**

What Insight Delivered

Insight collaborated with Shimmer to conduct a series of clinical and laboratory studies to provide data-sets to validate Shimmer's sensing platform in different application scenarios to include:

- **Tracking behaviours in selected clinical populations**
- **Analysing simultaneous bio-mechanical and physiological performance during exercise activity**

Measurable Impacts

The key outputs of this research include:

- **Successful realisation of signal processing solution for ambulatory HR measurement**
- **Strategies to measure behaviour and performance in health and sport**

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Background

Increased availability of wearable sensor technologies is changing the way we approach the measurement of human performance in health and sport. We are moving away from the traditional model of infrequent measurements carried out in a clinical or laboratory setting to a new paradigm where we can capture data relating to performance and behaviour longitudinally in the real world setting.

This has enormous potential for management of health and enhancement of performance in sport as it enables a true understanding of the factors that influence behaviour and performance in different settings. Thus, stakeholders, whether they be athletes, coaches, patients or clinicians, can be armed with the knowledge to help them make the right decisions in the right place at the right time. However, we have still a long way to go in terms of understanding how we can best capture target data, how it should be processed to extract knowledge, and how the resultant insights can be used in different application contexts.

Solution and Outcome

Insight conducted research on the potential role that harvesting of data, using a sensor platform, can have in management of health and enhancement of sporting performance – both at home and in the community. Shimmer was able to collaborate with Insight to collect and analyse data from a wearable, lightweight, low-power, wireless enabled sensor platform. The device can be attached to any part of the body to capture measurements of motion, heart rate, muscular activity and other physiological parameters

Shimmer's kinematic sensors incorporate a tri-axial accelerometer on the baseboard with a gyroscope daughter board that can be used to extract temporal parameters. This provides a portable low-cost solution for in-home and ambulatory evaluation of gait.

The sensors were deployed in a laboratory setting in order to validate them against gold standard measures and gather longitudinal datasets that in turn were then modelled against defined clinical endpoints.

Shimmer

For further details on Shimmer's products and services see www.shimmersensing.com

Insight

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"Working with Insight has been hugely beneficial to Shimmer. Validation of the data and derived metrics provided by our sensing platform has allowed us to improve product accuracy and robustness." Paddy White, CEO

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See Insight's contact information on the Web at www.insight-centre.org