Two Fantastic Remote Sensing Innovations

Two academic remote sensing research announcements caught our eye this week. To be fair most remote sensing announcements catch our eye, but these two were intriguing as they are repurposing remote sensing techniques.

Remote Sensing the Human Body
Researchers at Kyoto University Centre of Innovation have developed a system based on spread-spectrum radar technology to remotely sense signals from the human body. They have focussed on heartbeats, although they acknowledge that other elements such as breathing and movement are also measured by the system. It uses a unique signal analysis algorithm to extract the beats of the heart from the radar signals, and then calculates the intervals to give the heartbeat.

Anyone who has ever needed to wear a Holter monitor for twenty-four or forty-eight hours will appreciate the advantage of having measurements taken remotely, in real time. In addition, under controlled conditions, the system has worked with a similar accuracy to an electrocardiographs (ECG). This will be music to the ears of regular ECG takers who know how much removing those sticky electrode pads can hurt!

This system is still at an early developmental stage and further testing and validation is necessary, but it offers a potential new use of remote sensing technology.

Remote Sensing & Social Media
Researchers from Pennsylvania State University have led a project developing an innovative way of combining social media and remote sensing. The research was undertaken on a flood in Boulder, Colorado in September 2013 with a particular focus on urban locations.

The team identified over 150,000 flood related tweets and used a cloud-based geo-social networking application called CarbonScanner, from The Carbon Project, to cluster the pictures from Twitter and Flickr to identify flooding hotspots. These were then used to obtain optical data, in this case from the high resolution commercial satellite Worldview 2 and the lower resolution, but freely available, Landsat 8.

A machine learning algorithm was developed to perform a semi-automated classification to identify individual pixels that contained water. As the data was optical it used the near infrared band as, due to its strong absorption, water is easily distinguishable from soil and vegetation. The researchers believe that this methodology has the potential to give emergency teams near real-time data, which could make live-saving differences to their work.

This is a particularly interesting development for us, given our current work on flood-mapping using synthetic aperture radar (SAR) data as part of the Space for Smarter Government Programme.

These two current examples show that remote sensing is an exciting, innovative and developing field, and one that is not solely related to Earth observation.