

Date

Tuesday 14th July 2009

Title of session

Workshop: Research and innovation

Research, Innovation and Sensing: An Image centric Technology Perspective

Name of presenter/chair

Peter ter Haar, Director of Products, Ordnance Survey - Chair

Dr Robert Moses, CEO of PCI Geomatics, Canada - Presenter

Name of rapporteurs

Martin Lea & Carolina Sanchez Hernandez

Robert introduced his topic by looking at how things are changing in the imagery industry. With the great number of satellites launched over the last 15 years, with different pixel and spectral resolutions, imagery is the most cost effective and automatable of the GI technologies. The key to the future is *information extraction from earth observation data*.

Three profound changes in the next decade are:

- An increased number of cameras will be viewing the world from all angles
- The web will become the viewing and processing platform for imagery
- New algorithms will emerge to combine and extract useful information from imagery

In the next 5 or 10 years, web browsers will be able to query multiple public and private image sources at multiple resolutions; search for change and return coherent results within minutes with image matching, stitching and balancing done automatically.

These new modules need to be highly open ended and interoperable and based on open standards. Modules will need a high degree of parallelism to maintain the high processing needs and memory storage. This will also make metadata critical across SDI and WMS feeds.

With the huge number of satellites launched, a bottleneck is coming in processing power so new open ended technologies need to be progressed. At the moment

image interpretation is an operator-intensive activity. The pre-processing (geolocation, mosaicing, colour balancing, etc) is solved, even today, but automatic feature generation is only 25-30% effective for best cases.

To improve that percentage geoscience needs to look to neuroscience. Eyes absorb visual information and process it automatically; cells in the brain turn the world into an internal map and perform automatic feature recognition. This processing is done with basic “primitives” e.g. colour, texture, shape, size, which are then transformed and filtered to create object recognition.

This exiting research has begun at PCI Geomatics in partnership with the University of Ottawa.

Questions/Comments	Answers
Peter ter Haar: Where do you see the biggest challenge in data processing?	Dr Robert Moses: We need uptake of “cloud” processing
Rachapudi Siva Kumar: What automatic feature recognition should be focused on to minimise processor time?	Dr Robert Moses: Low resolution imagery should be used to identify change and then high resolution imagery used to capture the features