Geospatial Intelligence for National Security - DGI Conference 2018

The DGI conference, held in London, attracts military personnel and others, mainly from Europe and USA, interested in geospatial intelligence (GEOINT). The conference has been held annually for many years now and is an important event to discuss unclassified issues relating to GEOINT.

The emphasis in DGI 2018 was on meeting the challenges of a rapidly changing military situation and technological changes in GEOINT. A number of presentations focused on fairly general issues which included defence requirements, crowdsourcing, open data and issues of trust in data. Throughout the conference, speakers raised issues which are not directly related to geospatial information, but which impact on the way in which defence organisations use the data. Speakers referred to the changing political situation and talked about new types of warfare including cyber threats, and of 'relearning warfighting'. Brexit was raised several times and the general response on that was 'we don't like it, but we don't know how it will work out for research or collaboration'.

Familiar themes emerged: for example Terry Busch from the Defense Intelligence Agency (DIA) in the USA gave an eloquent argument for geography being a component of all data as it gives real-world setting to data and allows users to compare, correlate, contextualise and coalesce different types of data, and make visualisation possible. The constraints imposed by silo structures in organisations were also raised.

AI and Machine Learning

There was a lot on artificial intelligence and machine learning. Todd Bacastow from Penn State University set the scene with a presentation on 'Geospatial Intelligence: Human Abilities, Human Limitations, and Human Challenges' and used John Snow's work in the 1840s and 50s to illustrate human intelligence. He maintains that machines are better than humans in some areas, and that it is essential to ensure that humans are engaged in, and control, the system, arguing that teams should comprise both humans and machines. His blog on this topic is well worth reading at www.geointblog.com. Bacastow also asked the question 'will we be able to recognise machine-generated data on social media?' He also suggested that there is confirmation bias in deep learning.

The challenge of managing increasing data volume is a major issue. Anthony Quartararo, founder of a company called Spatial Networks grabbed attention by stating that 2.4 trillion locations per day were being recorded from smartphones and this will increase exponentially with data from IoT and autonomous vehicles. A number of ways of ameliorating the problems were suggested; all data has a location aspect and therefore location can be used as a filter, Quartararo also stressed that it is important to keep a human component in analysis. Other issues are unlocking the information in data which we already have, and of course trust and privacy. Crowdsourcing is used to provide trust in data through high redundancy and is very accurate. He claimed that the "notion of privacy won't exist in 2030".

Collaboration and Partnerships

Another theme which emerged from many speakers is the need for collaboration and partnerships with industry. Chris Hewett from Australia reported that government policy there is that there should be more collaboration with industry and more use of open source data. Earth observation data collection is based on commercial sources. Commercial cloud services are having a big impact on the way in which organisations work and big data opens new thinking.

Education and training was a frequent topic. Data analysts are recruited from many different disciplines but often lack data literacy. Data geeks are often the best people for this job but they are not aware of the potential of employment in geospatial. Ordnance Survey seeks to solve this problem by attracting start-ups to the Geovation Hub.

Although most speakers dealt with geospatial information for defence, several demonstrated that there is significant overlap with civilian applications. The EU Copernicus programme is one example and a major application here is migration and maritime surveillance, particularly in the Mediterranean Sea. The EU Satellite Centre is long established but is now important in GEOINT. The centre also works on border and immigration issues, for example determining migrant flows from imagery, humanitarian issues, disaster relief and peacekeeping operations, and uses commercial providers.

The Role of NMAs

One session was devoted to NMAs chaired by Mick Cory, Secretary General of Eurogeographics. The panelists were Ingrid Vanden Berghe, head of NGI in Belgium, Hansjoerrg Kutterrer, President of BKG in Germany and Nigel Clifford, CEO of Ordnance Survey. The main points to come from this discussion were that the democratisation of mapping is a game changer and that the role of government is moving from generating products to providing platforms and services, that is from map producer to information broker. It is important that NMAs should be recognised as an authoritative source, the main role of BKG is quality control. Nigel Clifford spoke of opportunities arising from deep data, 3D and smart cities but partnerships are essential. The issue of privacy and trust was raised again and Ingrid Vanden Berghe reported that NGI uses a peer crowd for updating and validating.

The exhibition included most of the main players in Earth observation such as Esri, Hexagon, Airbus, DigitalGlobe and Urthecast: all displaying their latest products. New EO companies are focusing on constellations of small satellites to give high repeat coverage of particular interest including Earth-i, a UK company (see GW March/April 2018). Urthecast has announced UrtheDaily, a constellation of medium-resolution optical satellites aiming to acquire high-quality, multispectral imagery, at 5m GSD, taken at the same time, from the same altitude, every day. BlackSky is a company specialising in analysis using multiple sources of information, they are developing their own constellation of satellites but also use many other sources such as Twitter and local news reports in order to detect significant activities and anomalies on the surface of the Earth. Capella Space is launching a constellation of 48 agile SAR satellites.

DGI is a unique event which brings together different communities and generates interesting discussion. The challenges of handling big data, sharing data and establishing partnerships are universal, but those working in defence have the additional challenge of producing information very quickly for decision makers. One speaker predicted a data-centric future and Nigel Clifford when asked about his view of the future replied "Excited".

This article was published in Geomatics World May/June 2018