Grand Challenges in Map Generalisation
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Where is the Art in the 'Art and Science' of Cartography

Cartography has been formalised as rules and algorithms which belie the fact that a map is something of distortion and compromise. There are subtle and aesthetic qualities that are critical to effective transmission – captured in the idea that cartography is both an art and a science. In pursuit of greater levels of automation is there a risk that we will lose this artistic dimension? Is it an oxymoron to assume that we can formalise the artistic dimension and embed 'art' in the algorithms we create? Or is a more systematic approach in which we exclude art a more predictable and consistent methodology?

100% Automation

Map generalisation has always had the ambition to increase levels of automation. Is it desirable or meaningful to assume that the goal is 100% automation? What does that mean exactly? Particularly when it comes to the shared creation of maps between the human and the machine? In topographic mapping the specifications have been arrived at over many decades, and here 100% automation in the production process has been achieved. In the context of highly thematic maps, perhaps it is neither definable, nor desirable.

Thematic Based Generalisation

The advent of the 'prosumer' (the person who both creates and uses their own map), coupled with opensource data has led to huge growth in the variety and styles of mapping, and what is mapped. Technology readily affords the gathering of text, images and maps (artistic, sketched, or formal) in order to tell a story. Previously the cartographic expert was the custodian of 'good mapping', but these high individualised maps demand that we design in accordance with the wishes of the user of the map. The idea of 'user knows best' perhaps requires us to give them easy to use map generalisation tools with which to create such stories.

Geographic Modelling and Automated Cartography

Geography is complex – its phenomena interact in vague and complex ways that change depending on the level of observation. Simple descriptions and representation of geographic entities limits the capacity of automation. The phrase semantic generalisation captures the need for data rich models that make explicit this inter dependency. Researchers have always understood the need for a holistic approach, but what does that mean? Moving further away from layer based models (modelling one feature type at a time), might enable us to achieve greater level of automation (but see above!).

The Role of Map Generalisation in Handling Complex Data

There are great expectations among those that create user generated content and location based social media that they will be able to manage (capture, integrate visualise) highly complex co-dependent data. Typically such data is noisy, dirty, incomplete and increasingly temporal (and temporary) in nature. Our map generalisation toolbox needs broadening to include other techniques and ways of seeing the world and handling such data. New approaches from outside the cartographic discipline may need to be brought into the fold (from statistical and visual analytics for example) in order to better manage the ever greater diversity of data collected from the human sensor network, and global data capture systems.