

## Semantic cartography

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### Abstract

Once the whole social world is relocated inside its metrological chains, an immense new landscape jumps into view. If knowledge of the social is limited to the termite galleries in which we have been travelling, what do we know about what is outside? Not much. (Bruno Latour 2005).

Locative media has capitalized upon the use of Global Positioning Systems to provide an adequate level of accuracy to support individual navigation and connections to services within a given vicinity. However as we move from the 'Sat Nav' model that provided us with route planning, to more context specific information, we can see how the base map is becoming less useful.

In an equally transformative manner, social navigation technologies such as collaborative filtering and recommender systems have supported the ability for Internet users to pass on tips, hints and tags and have provided a highly social dimension to cyberspace. Whether you prefer semantic web, web 2.0 or neither, devices such as 'tag clouds' have provided 'bottom up' ways to classify and attribute meaning to web content and, as the authors would argue, perform the function of a map.

The paper cites a series of precedents from contemporary digital arts and media

which support social commentary upon place, as well as case studies from the author's own research and teaching experiences. An analysis of these case studies are used to support a discussion about the 'temporal' nature of tagging that the authors argue often disappears as Cartesian maps are used as the primary interface to describe a socio/spatial context. The authors look toward a practical framework for the representation of social information that sustains an integrated model of space and time.

The paper explores the characteristics of a digital art project developed by the authors that allows users to 'read' and 'write' to a geo-located tag cloud that is visible under their feet as they walk through urban and rural environments. Map Cloud replaces the geographic base map that accompanies applications such as Google Maps for smart phones, with words derived from users who post 'tags' for specific locations. The authors reflect upon the temporal flexibility of this type of base map and upon the 'semantic cartography' that is constructed as users correlate meaning with location.

### **Locative media**

In 2003 a new term emerged in the media panorama to point out technologies and processes that promise to reconfigure our understanding and experiences of space and culture (Galloway, 2006), this term is *locative media*, defined as a 'test category'. The new terminology enlightens in the field of the media, in particular the mobile media, a shifting toward the hybrid of physical and digital communication space. Locative media is synonymous for the cultural and artistic production of location based services for the IT and marketing world. Both terms stress the relevance of location, context and context awareness in interaction design and in mass market products of communication.

Technologically speaking, locative media are enabled by global or local information and telecommunication systems such as GPS (Global Positioning System), GSM, bluetooth, wi-fi, rfid, etc. The aim of those technologies is to locate and track people, objects or digital information with a relative or absolute geographical position enabling 'new ways of engaging in the world and mapping its own domain' (Hemment, 2006), simultaneously linking the real and digital space, two dimensions in real time, transforming the perception of both domains. Nowadays mapping systems joined - in terms of diffusion and mass market - the location technologies.

Nicholas Nova (2004), in one of the first literature reviews on this subject, stated that two levels are at the basis of locative media: the physical environment and the human factor. The urban space of cities its cultures, histories, its everyday flows - places identified with latitude and longitude coordinates, on one side - on the other end, people with their emotions, thoughts, feelings, social interactions and so on. Contemporary artistic practices (geotagging, geoannotating, geocaching, gps drawing etc) explore and trigger these interactions revealing the urgency of new ways of approaching and understanding space and everyday experience in a hybrid ecosystem; the awareness between people and their environment (Shirvanee, 2006).

Elevating the discussion and experience over the layer of latitude and longitude coordinates are the next steps in which locative media are involved nowadays: reaffirming the relationship between art and everyday life (Mott, 1997); reconstructing social and cultural spaces (Wollensak, 2002); investigating the implication of new imaging and cartographies techniques on our sense of place (Wilson, 2002). In this sense the meme that has rapidly circulating among the community is really a 'test category' for the convergence of geographical and data space (Hemment, 2006).

### **Social navigation**

Social navigation finds its roots within the technologies that defined the Internet and its history is complex because of the interpretation of these technologies (Dourish and Chalmers, 1994). For Benyon, Höök and Munro the definition and development of social navigation is a broad inquiry that embraces a wide array of projects, but most importantly focuses upon the 'social' opportunities that are gained through supporting collaborative navigation methods (Höök et al 2003).

In its most basic form social navigation on the Internet can be the listing of other people's pages on your website. This process of posting navigation points for others to visit according to your own interests, represents an asynchronous and non-reciprocal form of navigation. Non-dynamic and updated only by the host, these links demonstrate the principle of indirect social navigation. Further developments include automated systems that follow rules according to users of sites and digital documents, their choice making procedures and building patterns that correlate with other users who may be navigating through similar information. The early development of these systems originated in filtering systems, as electronic mail was

the primary use of a computer network. Through the research dedicated to developing filtering systems Malone et al (1987) introduced the terms 'cognitive filtering', 'social filtering' and 'economic filtering', each process highlighting different priorities that were used to sort important emails from ones that could be ignored.

### **Semantic cartography foundations: a comparative appraisal of dn[T]3 and Tag Clouds**

To date the synthesis of locative media and social navigation is limited to popularity; giving details for restaurants when using a mobile application such as Urban Spoon, or the traffic updates on Google Maps and the busyness of roads seen from online CCTV cameras that might encourage a user to change a route according to social activity. Social navigation in online spaces (pre-mobile) transformed the organisation and presentation of data from linear, editor controlled material that was fixed according to the needs of the distributor, to a dynamic, democratic, user affected ecology. As the Google base map has become a primary substrate for many forms of locative media, the fixed nature of the underlying Cartesian grid represents a similar straight jacket within which social and semantic connections are suppressed.

Through a series of art projects the authors have identified the Web 2.0 technology of Tag Clouds as beginning to offer both social navigation and geographic qualities. Tag Clouds can be understood to be a form of socio-spatial map.

1. dn[T]3 Live Social / Semantic mapping, Turin, 2007.

The dn[T]<sup>3</sup> (pronunciation: dnt cube) is a participatory interactive projection for public spaces using mobile phone thought that balances art, information design and social computing. The title dnt recalls the dna, where the T of tag substitutes the a of acid to deliberately state the relevance of the tag as the structure of a new social knowledge, emerging from the people (Figure 1).

Through a very simple interaction process, that collects tags via SMS text, the project means to show emerging knowledge pattern, revealing and visualising how people perceive the world. The project applies a folksonomies model typical of Internet to the real world, although, instead of describing digital assets and classifying websites, people are asked to contribute to the creation of a meta-knowledge about emotions, concepts, everyday object or situations, everyday social life, etc.

dn[T]<sup>3</sup> is designed as a semantic ecosystem, a memetic ecology, where the tag is like meme - evolving as a semantic unit according Darwinian theory. dn[T]<sup>3</sup> custom folksonomies engine, an inferential engine, analyzes and tracks each tag received as absolute frequency and relations frequency. In the dn[T]<sup>3</sup> visual world, the tag flows from small to big, from private to public, from personal to collective. The visual interface is a complex representation system, fetching and rendering data in a self-organizing diagram, a collective cosmology.



Figure 1. dn[T]3 Live Social / Semantic mapping, Turin, 2007.

## 2. Tag Clouds exhibited work 'Notion / Notation', University of Plymouth.

The 'Tag Clouds' artwork (University of Plymouth 'Notion / Notation' exhibition) involved asking all of the artists who were exhibiting in the show for a list of their browser bookmarks. Once collected, an account for each artist was made on del.icio.us and the common websites that it's database recognised from other users generated tags for each entry. As a result of this process a tag cloud was made for each artist, which was then posted onto a large wall. The resulting tag clouds provided an extraordinary insight into the interests that informed each of the artists, and became a reflexive map of the works that many of them exhibited around the show (Figure 2).

The piece Tag Clouds was an interesting demonstration of how social navigation technology provides a 'map' of creative processes. Placed in the context of an art exhibition - an architectural space consisting of artwork to lend it a sense of place -

each tag cloud was a semantic map of the pieces of work. When viewed together, all the tag clouds were a map of the show. As a conceptual strategy the work provided a highly reflexive guide to the show and in many cases corresponded well with their work. The Tag Clouds that were exhibited became social cartographies that described not only each exhibitor, but the architecture of the exhibition as a whole.

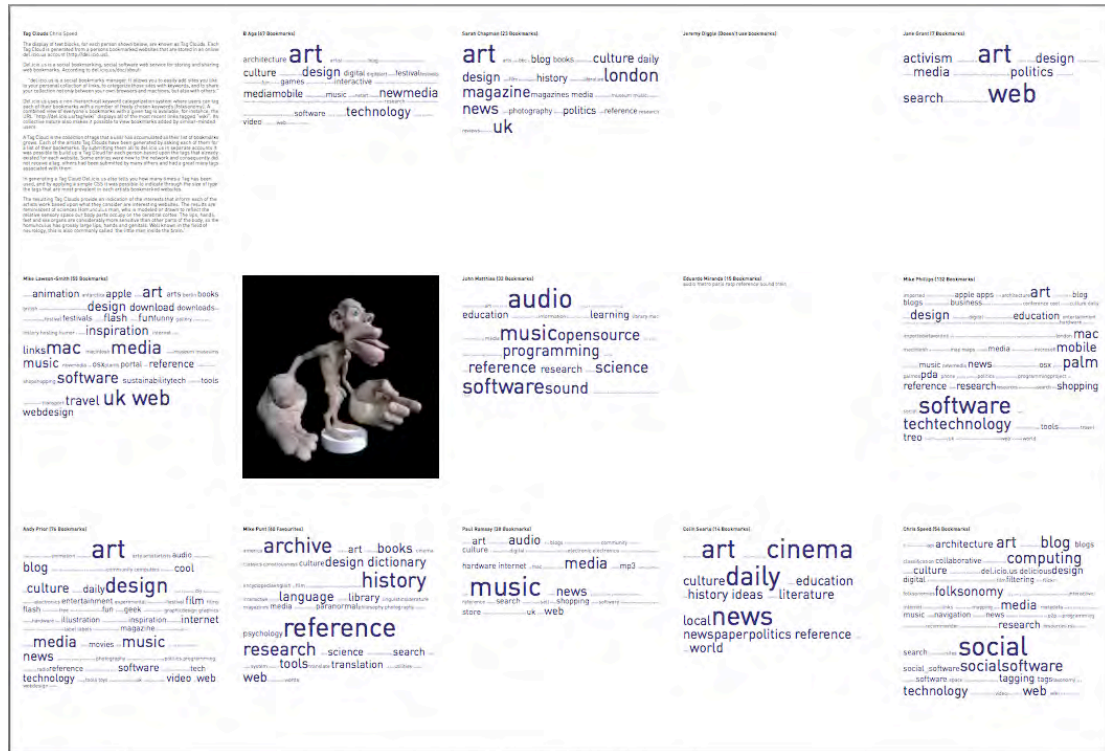


Figure 2. Tag Clouds exhibited work 'Notion / Notation', University of Plymouth, 2006.

## Mobile trajectory

The use of the tags cloud as socio-spatial reflexive models represents an initial step in demonstrating live, socially manifested semantic cartographies. Both projects, dn[T]<sup>3</sup> and Tag Clouds, had begun to demonstrate that it was possible to construct a limited, but nevertheless spatial framework that encapsulated socio-spatial systems without the use of Cartesian coordinate system based plans.

The authors' works demonstrate an opportunity for social navigation and spatial media to begin mixing the representational and cognitive models of an environment. The next step is to integrate this into the same experiential context as locative media.

## Outline of Map Cloud

The Map Cloud model proposes a reformulation of digital cartography for mobile-locative media based on the situated semantic approach (McCullough, 2006): a social navigation system mixing folksonomies and refined semantic engine to reveal and to navigate in real time and in real space the mixed topography of our environment.

## Map Cloud design strategies

Translate and merge the two models (Tag cloud - spatial, and dn[T]3 - semantic) into a mobile context in terms of media and navigation. Consider screen size and resolution, the semantic map visual model and contextual geographical data. Refine the semantic engine of the dn[T]3, tuning the relational inferential engine for a spatial context by means of social and cognitive filtering. Develop a dynamic navigation that is informed through social feedback and contextual semantics.

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