

Visualising the Locative Experience

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With the accessibility of GPS (Geographical Positioning System) enabled technology, creative practitioners and technologists are rapidly increasing their use of GPS devices to capture locational data as representations of time and space. The methods of visually transforming locational data are diverse and represent a rapidly emerging field of visual practice that enriches our understanding of human interaction with a given location.

Visualisation of locational data consists of two main types of visual content — firstly, the GPS data and secondly, contextual data collected along the journey (photographs, personal notes, sound, etc). The former is a literal transcript — a static, one-dimensional representation rendered into a simple graphic form such as XY and Z coordinates and/or a point-to-point mapping which traces the journey. The latter, being interpretive content, is representative of the location and the traveller and by extension, the social/cultural aspects of the community or environment. Our survey of on-line GPS visualisations revealed that a majority of practitioners were exploring visualisation of GPS data alone with few augmenting this with contextual data.

To gain greater understanding of the field the authors considered the visualisation of GPS data as explored from an information design perspective¹ and focused on how space and time could be given dimension and meaning through its visual representation. From this approach, a contextual classification system was developed that identified the use of line, colour and symbol as the common codification techniques used by creative practitioners working with locational data. This classification helps us to assess the convergence of the

codification as visualisation systems (see illustration 1) and in doing so, to develop an application tool which may be used by practitioners to visualise GPS and contextual data in a manner that achieves an immersive embodied experience.

Codification of Locational Data

In developing our codification system the work of Drew Hemment² informed our understanding of the emerging practices of locative art. He proposed that artworks in the field fell into three main categories including mapping; geo-annotation; and, ambulant. In creating these categories Hemment provides the basis for critical evaluation of the field including identification of those categories that have yet to be explored such as the practice of mining quantitative information in relation to interactions with physical spaces (i.e. biological data).³

We sought to build upon Hemment's work by performing analysis of the current techniques used to visualize time and space in the context of mapping and geo-annotation. Our study focused on locative media projects that visualised GPS data as its main form of communication and we found the most common techniques used were the codification of line, colour and symbols to represent time, space and experiences (see illustration 1).

a. Line

For the majority of GPS visualisations, a single line is employed to trace the journey from a bird's eye view along the "X" and "Y" axis. The direction and angle of this single line trace can be further coded to enable greater interpretation of the data. For example, in *Flycab*,⁴ a third dimension is used to represent repeated journeys over the same geographic location.

b. Colour

There are currently two prominent methods of using colour — firstly, to distinguish elements (i.e. differentiate the trace from the background or separate overlapping traces of multiple journeys) and secondly, to visualise quantitative data. The second method describes the practice of codifying colour in ways to reveal the imperceptible relationships between geographical locations and its inhabitants. This technique assigns quantitative data to the colour or opacity values to assist viewers to perceive changing patterns as demonstrated in *GPS-quisse*,⁵ *Graz in Real Time* and *AIR*.⁶

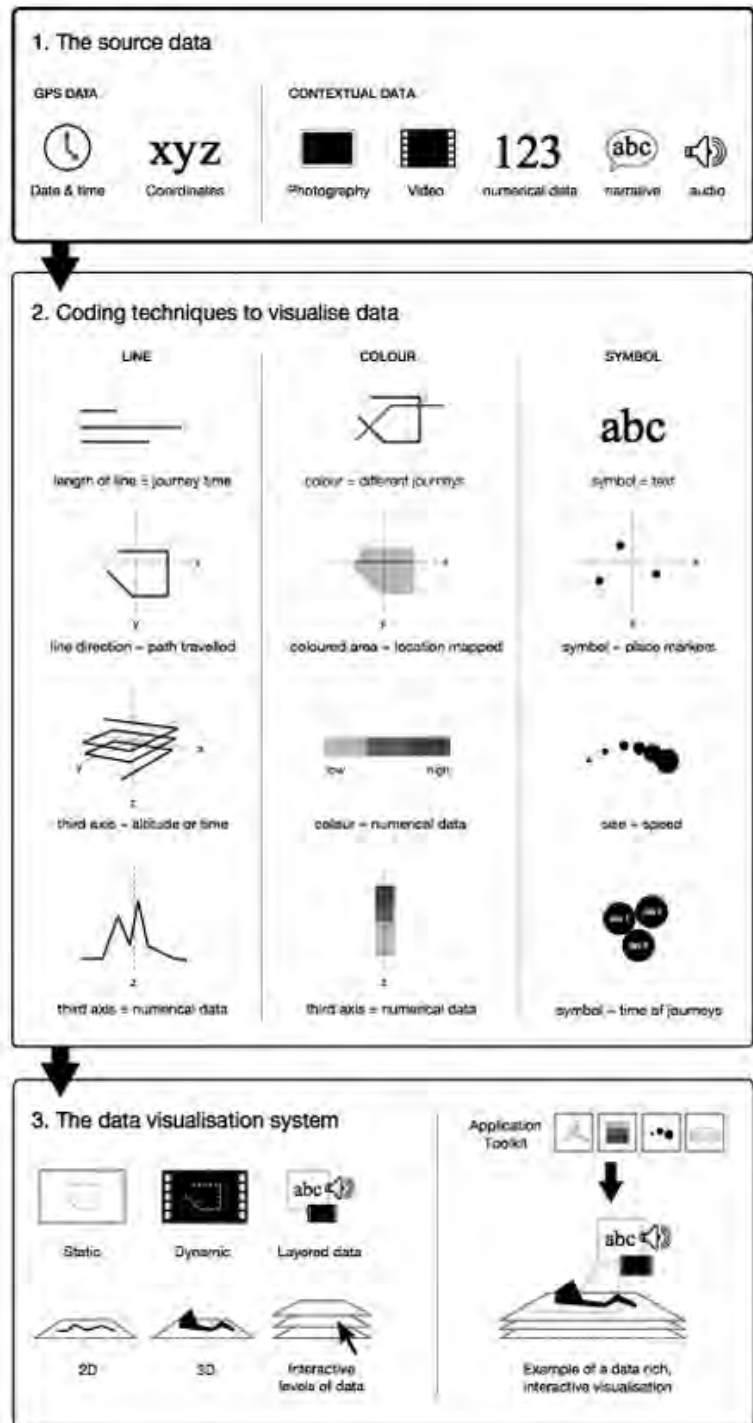
c. Symbol

There are two main forms of symbol use — the graphic mark (e.g. a cross hair) and text. The use of symbols becomes more interpretive when they form a meaningful link to the geographic location by allowing the viewer to reflect on the experience or social/cultural aspect of the location. For example in *AIR*, the location of symbols (representing a pollutant source) takes on a new meaning when combined with quantitative data revealing the emerging pollutant levels around the city.

New ways of visualising locational data

In performing the above analysis our aim is to develop an application that will enable practitioners to create new ways of visualising locational data. The classification system described above would be integrated into a sophisticated visualisation development tool similar to a multimedia authoring program. Users of the application may import a range of source data such as GPS, video, sound or text and manipulate its visualisation via a toolkit of pre-designed techniques (e.g. line, symbol, 2D or 3D forms). An application of this nature would enable practitioners to explore highly interpretative aspects of the locative experience such as geographic elasticity, temporal experiences, montage, audio manipulation and personal narratives (e.g. using biological, historical or cultural

Illustration 1
Created by Teresa Leung



data) and thereby produce visualisations capable of enhancing the viewer's sense of physical specificity and embodiment.

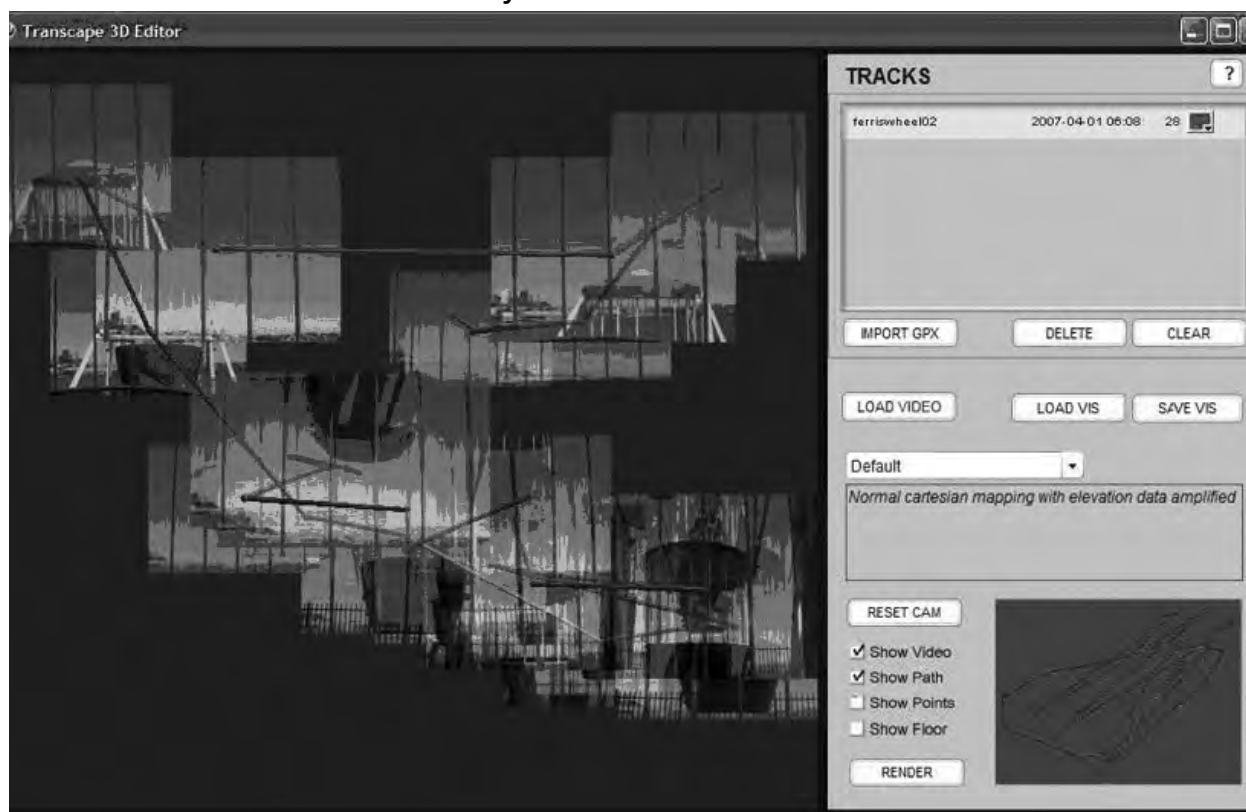
Whilst still in an initial prototype phase, the CDD's *Transcape Editor*⁷ (see illustration 2) is proposed for development in Macromedia Director and Macromedia Flash. Various source data can be imported and then manipulated through a suite of filters allowing the practitioner to create experiences which may explore 3D and 2D representations of the data in both passive and interactive modes.

Our motivation for developing this application is to facilitate deeper levels of engagement with locational data to create visualisations that extend our understanding of measurable and divisible space and time (physical specificity). We propose that visualisation of GPS data alone is insufficient for this purpose and

it must be augmented with contextual data such as photography, video, biodata, narrative and audio to allow for an enhanced experience of physical specificity that goes beyond the indexical simulation of time and space (i.e. Cartesian X, Y, and Z coordinate mapping).⁸ Methods of transforming GPS data are emerging that explore geographic and temporal elasticity. For example, this elasticity is achieved by using interactivity to reveal layers of experience in a non-linear system or by exploring systems that favour time and experience over geographic representation.⁹ Such experimentations in visualisation could be readily explored and further developed through the *Transcape Editor*.

Ultimately, we wish to see locative arts further advance our understanding of geographical terrain as a topological space that is both real and abstract — to experience the physical journey in a new light, offering an alternative glimpse into an otherwise ordinary moment in place and time.

Illustration 2
Created by Elisa Lee and Adam Hinshaw



1 Leung, Teresa. Report on the Visualisation of GPS Data (2006), UTS

2 Hemment Drew. 2006. "Locative Arts" In *Leonardo* 39 (4). MIT Press.

3 Nold Christian. "Biomapping" <biomapping.net/new.htm>

4 Apodaca Tomas "Fly Cab" and Balkin Amy "In Transit" <cabspotting.org/projects/flycab>

5 Lee Elisa and Hinshaw Adam <http://www.educ.dab.uts.edu.au/cdd/?page_id=22>

6 SENSEable City Lab, MIT "Mobile Landscape I Graz in Real Time" <senseable.mit.edu/projects/graz/graz.htm#PDF> and Preemptive Media "AIR: Area's Immediate Reading" <pm-air.net>

7 Lee Elisa and Hinshaw Adam. 2006. "Report on Transcapes 0.3." UTS

8 Arnall Timo "Time that land forgot" <www.elasticspace.com/2004/07/timeland>

9 Thirion Steph with Medialab Prado "Cascade on wheels" <www.trsp.net/cow> and *Time that land forgot*