A PHOTOGRAPHIC SNAPSHOT LIFELINE STRIP IN A SPACE-TIME CUBE

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This paper describes a powerful combination of a 3D space-time map and a narrative of a journey captured by a series of photographs. As such, the photographs form episodic snapshots of the events that occur within the journey. Such snapshots have in the past been arranged so as to tell a story in comic strip form. Snapshots also represent a common basis – as the timeslice – of representing geographic phenomena in episodic time in a GIS (Langran, 1992). It is the intention here to achieve the same effect but take advantage of the freedom afforded by digital representation (over the limitations of paper) in forming a plotted lifeline strip through xyt space time (Hagerstrand's space-time aquarium [1970] or Kraak's space-time cube[2003]). The lifting of analogue constraints manifests itself in not having to fit within a physical page and enabling interactivity (regarding the strip as a succession of photos in comic strip style).

This is the theoretical basis for embedding a comic strip in a space-time map (Moore, 2009) – that to move along the strip in linear narrative along the time line of the story is to also move along the time axis of the map. There is a natural affinity between the two representations, enabling their meshing together.

The aim of the hybrid representation is to depict two views of a journey (by motorbike across the USA). One is measured and scientific, the output of the GPS unit on the bike. The other is a qualitative record of the journey, the photographs that are part and parcel of our lives and are particularly valuable in commemorating significant occasions, such as this journey is.

The GPS data was downloaded using DNR Garmin into ESRI ArcGIS. The track data was converted into a 3D line with the Z field being linked to time. Within the ArcScene module this enabled an xyt view, with the lifeline formed extruded to the base xy plane, forming a "curtain" (this avoids the viewer relying too much on a suspended lifeline in 3D space, by anchoring it to the ground - Chew et al, 2007). This was exported as a 3D scene (VRML97 format) and edited in Blender, a 3D modelling package. The editing converted the 3D map into a sculpted primitive, then mapped photographs from the road trip onto the primitive. The last stage in the process is the importing of the 3D map into a desktop virtual reality environment (Second Life), where users are able (via avatars) to follow the road trip narrative in comic strip photo form, as plotted in xyt space, and explore the inter-relations between both representations.

Although the representation as developed here is only suited to specific events with space-time data, the digital implementation facilitates future development of more complex functionality, such as being able to zoom into specific areas of activity on a timeline with predominant inactivity (i.e. if only vacations were depicted). Although the 3D virtual environment currently allows interactive zooming, driven by the avatar, there are no facilities for provision of greater amounts of detail once you are close up to the object. Increasingly, we are likely to deal with situations with too much data to be comfortably shown with the featured visualization method, even at the smallest scale, due to people having the means to collect data about their space-time behavior on a daily basis. In these cases, the ability to generalize the data should be built in (perhaps coordinated with the multi-scale structure implied by zooming into greater levels of detail).

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