

Community space-time flow expression

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Abstract:

In the project ‘Journey as a Flow’ (Stanczak and Moore, 2021) we worked on artistic representation of time-space flows in different environments, following on from recent artistic efforts to link space-time representation to emotional journeys (e.g. Harmon, 2009; Baconnier et al, 2012). One example scenario was, a perception of an individual’s journey in relation to other participants or to environmental restrictions. Nowadays, we often consider collections of transport routes, where different environments of flows can cross and where different perspectives can be centralised in just one location, as an important factor in modern cities (Fig.1). However, knowledge about existing urban environments often involves understanding of different individual perspectives, which needs to be maintained in collective transport representation. This affords a new opportunity for artistic expression in space-time. If we can illustrate such individual time-space flows collectively, they might lead us to the most important parts of an urban community’s life.

Environments of individual flows within a city can be influenced by a centralised set of essential significant places of a community’s life. By following the definitions of “location” and “place” indicated by Edward Relph, we can draw attention to how specific human interactions might occur within an environment of time-space flows (Relph, 1976). “What the individual requires.. is not a plot of ground but a place – a context within which he can expand and become himself. (...) it must be shaped, usually over long periods of time, by the common affairs of men and women. It must be given scale and meaning by their love. And then it must be preserved.” (August Heckscher cited in Relph, idem).

As a basis for representation, from Hägerstrand’s time geography the bundle is important in the context of this paper, as it is used to define two or more individuals that share space over the same period of time (Hägerstrand 1970). For example, individual paths of members of a household within one home and combined with their possessions and materials can be described as a bundle. Alternatively, in a factory a bundle can be described as the time-space arrangement of employees, materials and machines (Ellegard 2018). Bundles are analogous to the aforementioned collections of transport routes, the difference being that the routes in bundles represent the paths of people (leading to places being created), whereas transport routes per se do not necessarily need the path of a person to exist. Another time geography concept used here is the prism, the 3D shape containing all potential time-space flows relative to a point in time. The prism was introduced by Hägerstrand, explored by Lenntorp (different modes of transport leading to different prism shapes) and refined in the 1990s by Miller (e.g. prisms based on network rather than Euclidean paths). Associated with the prism is the concept of the Potential Path Area (PPA), the area that could be reached from a location within a given time (Figure 2). More recently, the 2D PPA concept has been extended into a 3D ellipsoid located within three dimensional geographic space (i.e. xyz). The ellipsoid is the projection of a four-dimensional Space-Time Prism (4D accessibility volume between two observed positions) onto the 3D Space Time Hyper Cube. (e.g. Demsar & Long 2016; Figure 5).

In modern cities, communities might be living in just one location, or more likely, the individuals of one community might be spread across various locations, their perception of places suggesting different space-time connections and bridges (Figure 1) extracted from their space-time flows. We could imagine a model expressing the essential time-space flows for a community, in which a PPA around a specific location in time results in creating the building blocks of the prism of the individual pathways connected in the bundle at the same time (Fig.2).

The visualisation of a configuration of various flows, coming from different geographical locations within a community to form a convex and enclosing 3D polygon, can show several individual perspectives connected to the central bundle (represented as periods of time). That 3D “cloud” (Fig.3), a subset of the prism (i.e. depicting actual vs potential space-time flow), shows how bundles become moments of connections/exchanges between different individuals living in the same community. The return trip is also depicted, where we might observe that individual flows become closer to one another as some participants choose to continue the journey together, and this has a distinct visual effect in the artwork when compared to the more expansive incoming routes to the bundle. Also, if we examine the role of the prism further,

we might imagine that all the essential places of community's life are integrated within this, all potential places encouraging the community's incoming and outgoing flows. In summary, the cloud / prism, representing Relph's "common affairs of men and women" which combine to create place, becomes a potential space-time volume in which resides the spiritual and mental heart of a community (Figure 4).

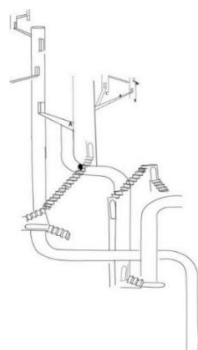


Figure 1. Collections of transport routes including trains, underground etc

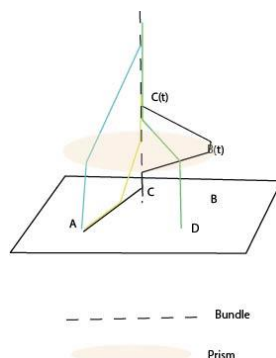


Figure 2. Space-time flows connecting at point C

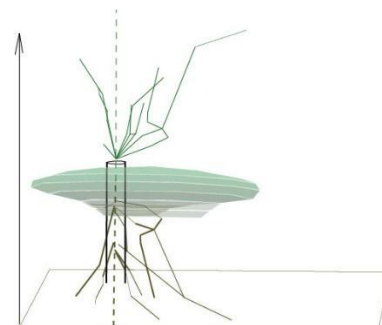


Figure 3. Symbolic 3D cloud with bundle location and converging / diverging route

This artistic idea provides inspiration for a case study: the reconstruction of the city of Noto in Sicily (Fig.5), where the main bundle has been created by the attractive presence of Cathedral of Saint Nicolas (e.g. Tobriner 1982) using PPA ellipsoids. According to this model, the major axis of all ellipsoids contain two points (one of the essential historical buildings and Cathedral of San Nicolo, point C). Thus the Cathedral becomes the central bundle relative to all of the potential surrounding locations (A, B, D) while points e, f and g are located within the potential path area for each individual movement to that central point C. Above the model, different slices of 3D symbolic cloud reinforce the expression of the community's union in time-space, geometrically and socially.

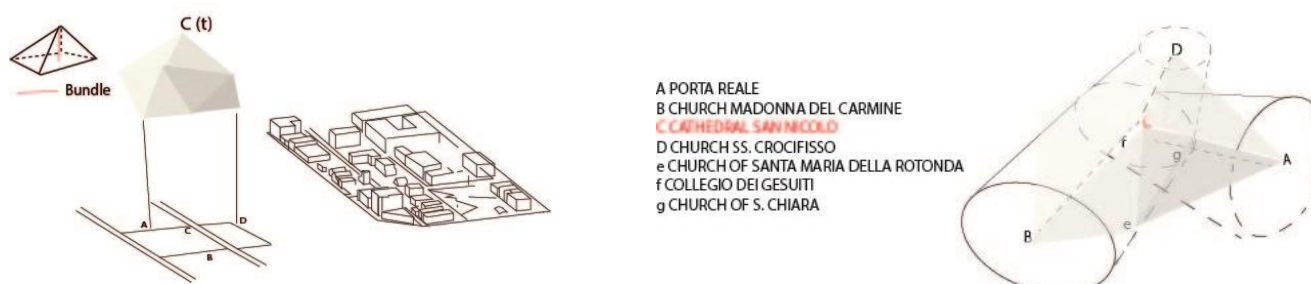


Figure 4. Symbolic 3D cloud with bundle location and major stops Figure 5. 3D cloud inspired by of (re)construction of Noto antica

Originally conceived as a 3D exhibition, the project 'Journey as a Flow' might be used for various purposes. We worked on showing a displacement seen as a phenomenon taking place in platial environments of flows. In order to have a better understanding of various local communities and their places, co-existing within an urban space or in rural locations, we propose the artistic and expressive representation of individual space-time flows, the bundles formed where they converge, the 3D convex hulls that contain the flow lines, and the prisms that represent the extent of potential flows. There are numerous potential drivers of various transformations and modifications that could be applied to original plans of places, including climate change and other natural events such as volcanic eruptions. Our project provides a visual tool in which time-space environments of flows can be better observed, analysed and preserved in this context.

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