**TRAVIS — Ontology**

<2 figures>

**A Digital Humanities GIS Ontology: *Tweetflickertubing* James Joyce’s *Ulysses* (1922)**

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This Digital Humanities GIS (DHGSI) model cross-pollinates literary and social media practices to engage in a participatory, performative, and augmented reality survey of the relations between James Joyce’s novel *Ulysses* (1922) and digital eco-system productions of dialogical and social space (Goodchild, 2009; Sieber, Wellen, and Yuan 2011; Priem, 2011; Young and Gilmore, 2013; Graham and Zook, 2013; Lin, 2013). Joyce famously boasted that the aim of *Ulysses* (which kaleidoscopically relates the urban journeys of student Stephen Dedalus and advertising salesman Leopold Bloom on 16 June 1904) was ‘to give a picture of Dublin so complete that if the city one day suddenly disappeared from the earth it could be reconstructed out of my book’ (Budgen, 1972, 69). The model integrates a *Ulysses* schema outline with live geo-spatially enabled Twitter, Flickr, and YouTube posts to map the language operating in a Bloomsday-generated digital eco-system to re-create the discourse of a virtual Joycean Dublin during the annual celebration of the novel. Consequently the ‘Joycean’ neologism *tweetflickertubing* was coined to describe the ontological shift indicated by the HGIS model’s methodology.

**Creating the Model**

In 1920 Joyce drafted a schema outlining *Ulysses’* eighteen Homeric episodes for the Italian critic Carlo Linati, to whom he wrote, ‘in view of the enormous bulk and the more than enormous complexity of my damned monster-novel it would be better to send . . . a sort of summary-key-skeleton schema’ (Ellman, 1974, 187). The schema’s grid designates episode title, time, color, people, science/art, meaning, technic, organ, and symbols. To create the model an Excel spreadsheet (Figure 1) was populated with this data and geo-coded according to GPS-designated decimal degree locations of the 18 Homeric episode sites in Dublin. These sites were identified through the 1904 *Thom’s Map of Dublin*, Ian Gunn and Clive Hart’s *James Joyce’s Dublin: A Topographical Guide* (2004), and GIS ‘ground-truthing’ methods, and checked against the ‘what’s here’ function of the Google Maps app.

Site centroids were approximately identified to concrete locations described in *Ulysses* because the various characters’ movements and locations within the novel (such as the Wandering Rocks episode) occur simultaneously and at multiple sites within and beyond the geographical and temporal boundaries distinguishing each episode in the schema. The Excel database was imported into Google Fusion and visualized through its Google Maps function. The database was also converted to a CSV file and imported into the ArcGIS Online platform and integrated with a live social media map layer.



Figure 1: Fragments of the Carlo Linati schema, Google Fusion map, and Excel/CVS Geo database.

**Surveying Bloomsday Digital Ecosystem**

Surveys were taken on 16 June 2014 at hourly intervals, based upon the chronology from the Linati schema, and were divided into two categories: local (Dublin) and global, weighed by the indices of site and time, respectively. Several keywords—such as ‘James Joyce’, ‘Ulysses’, and ‘Bloomsday’, as well as character and episode names from the novel—were tested in the model’s Twitter, Flickr, and YouTube search engines. ‘Bloomsday’ received the highest number of hits and became the main survey keyword.

The local survey focused on activity around Homeric episode sites in Dublin, and found that Davy Byrne’s Pub on Duke Street and Joyce’s Martello Tower associated with the *Lestrygonians* and *Telemachus* episodes attracted the most posts. Tweet postings did not, however, correspond with the chronology of *Ulysses’* narrative outlined in the schema, illustrating that social media activity aggregated around site location rather than novelistic time. A Tweeted image (Figure 2) captures throngs of people in funny hats assembled around Byrne’s pub, and it seems that Joyce’s identification of the ‘Oesophagus’ as the body organ symbol for this episode was indeed apt. The National Library site was originally geo-coded as the centroid of the *Lestrygonians* episode; however, survey results suggest that perhaps because of the social gravity indicated by the number of social media posts, the centroid should be re-located to the site of the pub, illustrating the iterative process integral to Neogeographical mapping practices. In the case of the global survey, Tweets blossomed across Europe, the Middle East, Asia, Australia-Pacific, North America, and Latin America during the entire chronology of the Linatischema. ‘Orphan’ Tweets (corresponding outside of the hourly periods not included in the schema) were placed either in preceding episode time slots or in the Penelope episode—whose time indices encompass ‘Infinity’ (see Bloomsday Tweet Schema in poster).

Figure 2. Live social media map integrated with the Linati schema geo-database.

Surveys taken before, on, and following Bloomsday 2014 illustrate that Flickr and YouTube postings with time lags, and reflecting activity over the course of a year, exhibited the most aggregated social media activity. However, over the course of the 16 June 2014 survey, it became apparent that dominant social media ecosystem activity on Bloomsday occurred in Twitter. The following verbal snapshot reflects a parsing of language activity (see Bloomsday Tweet Schema in poster) articulated in this digital eco-system: ‘People in Dublin are wearing funny hats because it is Bloomsday and elderly ladies are getting rowdy in Davy Byrne’s Pub; a wedding anniversary is observed in Glasnevin, North Dublin, while a Spanish tweeter celebrates with a Domino’s Pizza and the latest *X-Men* film. Individuals in Dublin, Paris and Washington D.C. resolve to again attempt to read *Ulysses*, and a tweeter in Uruguay mentions Bloomsday to her Irish boyfriend, who asks if the day has anything to do with flowers. A few literary minded types post Joycean lines from the novel, while two individuals from Dublin get suited up in Edwardian clothes to face the day; one tweeter reflecting on the day after the night before, asks if Bloomsday was a joke brought up in a drinking session. A tweeter from Mexico City advertises online translations of Joyce’s “lascivious” letters to his wife Nora Barnacle. The celebration of *Ulysses* converges with perhaps a larger global event to provoke a Dublin tweeter to state that there is “Nothing like a combo of World Cup and bloomsday to hear people who don’t like either Joyce or football talk about both”. One wry observation from the Bronx asks if “Bloomsday is Paddy’s Day for posh people?” And two more tweets from the USA proclaim “I’m pretty sure Joyce would love hashtags”, and “To paraphrase Laurie Anderson: *Ulysses*? Never read it”’.

A corollary can be made between Joyce’s writing technique in *Ulysses* and the use of language in this Twitter-based digital ecosystem. Joyce’s stream-of-consciousness technique mimicked the various ways in which the human mind ‘speaks’ to itself, through complex fluid patterns, random interruptions, incomplete thoughts, half words, and tangents (Norris and Flint, 2000, 126). Tweets, limited to a certain number of characters, reflect Joyce’s technique by conveying both focused and random thoughts, and illuminate Graham and Zook’s (2013, 78) contention that the ‘digital dimensions of places are fractured along a number of axes such as location, language, and social networks with correspondingly splintered representations customized to individuals’ unique sets of abilities and backgrounds’. The DHGIS model illuminates how literary and historical tropes can aid in contextualizing and mapping social media activity through the creation of interpretive schemas to study interactions between language, behaviour, time, and place.

**DHGIS Implications**

Re-conceptualizing J. B. Harley’s observation that ‘text’ is a better metaphor for maps than the mirror of nature through the lens of the digital humanities, it can be seen that HGIS-generated ‘maps are a cultural text. By accepting their textuality we are able to embrace a number of different interpretative possibilities’ (1989, 4). The DHGIS model enabled digital inter-textual relationships between *Ulysses*, the Linati schema, and the dialogical and social space reflected in the Bloomsday social media eco-system. Subsequently, digital humanities methodologies of *deformance* and *ergodicity* were applied as interpretative techniques. By translating one ontological form of discourse to another, *deformance* applies *scientia* to *poeisis* and seeks to explain unitary and unique phenomena (such as the language activity in the Bloomsday social media ecosystem) rather than establish a set of general rules or laws (McGann and Samuels, 1999). *Ergodicity* involves an interactive type of labor between the GIS practitioner/author/coder, reader/viewer, and mapping subject to create the potential multiple narrative paths composing a digital text. *Ergodic* applications of GIS create non-linear narratives that converge and disrupt both quotidian and epochal chronologies of time and space. As a literary tool, this DHGIS model synchronizes the resulting layers of images, words, and vectors into contrapuntal, multi-dimensional digital narratives, providing the means to ‘reconnect the representational spaces of literary texts not only to material spaces they depict, but also reverse the moment’ (Staley, 2007; Thacker, 2005, 63). Lastly, DHGIS, digital, spatial, and heohumanities modelling techniques, integrated with radical statistics holds the potential to engage Qualitative & Critical GIS / GIScience studies with reflexive epistemologies to address the situatedness and positionality of Big Data as it relates to sustainability initiatives, smart city planning, transport and public health, disaster preparedness, and social and regional conflict (Cope and Elwood, 2009; Aitken and Craine, 2009; Bodenhamer et al., 2010; Dear et al., 2011; Meir, 2011; Elwood et al., 2012; Kwan and Schwanen, 2012; Leventala, 2012; Kitchin, 2014; Travis, 2014).

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