The Constraints and Benefits of Space and Time in Digital Social Networks

MATTHEW ZOOK
Department of Geography
University of Kentucky
Email: zook@uky.edu

I highlight three key issues related to integrating the constraints and benefits of space and time in digital social networks. They are (1) selecting the appropriate space-time scale of analysis; (2) integrating space and time within existing theories of strong/weak social ties; and (3) recognizing that software is an actor.

Finding the appropriate space-time scale of analysis

Bringing space and time into social analysis necessarily means that we must deal with the modifiable areal unit problem or boundary issues. In short, how do we define the space-time units in which social action takes place? This is a long standing issue for Geography but working with digital social networks creates a range of new problems and opportunities. These include:

- How accurate and precise is the spatial data associated with social networks? If it is user provided, how confident are we in this volunteered data?
- Can we use spatial data to create internally generated and defined spatial units? Can we use these organically defined regions instead of traditionally defined ones?
- How does scale affect the way in which space interacts with social networks? For example, does physical proximity matter a lot up to 25 km (the metropolitan level) and then its importance dramatically drops off? In other words, how is the relationship between physical distance and social networks kinked?
- How do existing physical networks of transportation and trade as well as historical ties of colonialism, language and culture, kink space in social networks?

The appearance of large and comprehensive data sets (e.g., University of Tartu's data on the location of all mobile phone calls within Estonia over the past six years) provides the means for putting these questions to task.

Theorizing Space and Time in Social Ties

Related to the previous issue of appropriate scale is how we theorize space and time in social networks. While the concepts of strong and weak ties in social action are well established, I feel it is worth revisiting how they relate to space and time. We have moved beyond simply equating physical proximity with strong ties but there is clearly a relationship albeit complex, multifaceted and with scalar effects. At this point I am thinking in terms of a typology of three binary variables based on sociability (strong and weak), physical distance (proximate and remote) and time (synchronous and synchronous). A weak, proximate, synchronous tie would be saying hello to an acquaintance on the way to work. A weak,

proximate, asynchronous tie could be user generated Google placemarks in augmented reality. Directionality and power are other possibilities and clearly variables need not be restricted to only two values.

Sociability	Strong		Weak	
Physical	Proximate	Remote	Proximate	Remote
Time				
Timely (Synchronous)				
Timeless (Asynchronous)				

Software as an actor

Although software code is often viewed as an objective means/tool for a wide range of human activity it is also an actor and determines what is allowed and what is denied. At the most basic level it is the codification of rules and decisions made by human actors and as AI develops, its own agency increases. Code is based on selective decisions (e.g., valuing security over openness) which creates a politics of code that is often overlooked. For example, the structure of the TCP/IP protocol laid the foundation for an extremely decentralized Internet. In contrast, the code behind virtual worlds and social networking tools is closed and proprietary. This both increases user lock-in and creates barriers for researchers interested in studying these emerging social phenomenons.

As increasing amounts of digital social activities take place via proprietary networks the challenge of measuring them is ever changing. While the digitized and coded nature of online social interaction provide the means for collecting social network data, many key parts of the social metaverse are operated in a fashion that confounds researchers. For example, Pete Warden was able to gather data on Facebook connections (in accordance with the rules set out by their robots.txt file) but due to threatened legal action ended up destroying the collected data (http://petewarden.typepad.com/searchbrowser/2010/04/how-i-got-sued-by-facebook.html). Even Twitter which provides garden hose and fire hose feeds of Tweets does not specify the way in which these feeds are generated, calling into question basic assumptions needed for research, i.e., selecting a randomized sample. Other issues such as privacy and access are also tied to the structure of code.

Because digital social networks are increasing interconnected with the material, e.g., Foursquare, Facebook Places, the power of code is manifest in how space and time interacts with social networks. As such, code is both the enabling and limiting factor in the creation of the metaverse, making its politics an important subject for researchers. Efforts by private actors to exert control over code for their own self-interests are continuous. Commons based coding—a TCP/IP for the metaverse—may be one way of dealing with this issue.