Which way up?

Reading and drawing maps of the blogosphere.

Abstract

Mapping the physical world, the arrangement of continents and oceans, cities and villages, mountains and deserts, while not without its own contentious aspects, can at least draw upon centuries of previous work in cartography and discovery. To map virtual spaces is another challenge altogether. Are cartographic conventions applicable to depictions of the blogosphere, or the internet in general? Is a more mathematical approach required to even start to make sense of the shape of the blogosphere, to understand the network created by and between blogs?

With my research comparing information flows in the Australian and French political blogs, visualising the data obtained is important as it can demonstrate the spread of ideas and topics across blogs. However, how best to depict the flows, links, and the spaces between is still unclear. Is network theory and systems of hubs and nodes more relevant than mass communication theories to the research at hand, influencing the nature of any map produced? Is it even a good idea to try and apply boundaries like 'Australian' and 'French' to parts of a map that does not reflect international borders or the Mercator projection?

While drawing upon some of my work-in-progress, this paper will also evaluate previous maps of the blogosphere and approaches to depicting networks of blogs. As such, the paper will provide a greater awareness of the tools available and the strengths and limitations of mapping methodologies, helping to shape the direction of my research in a field still very much under development.

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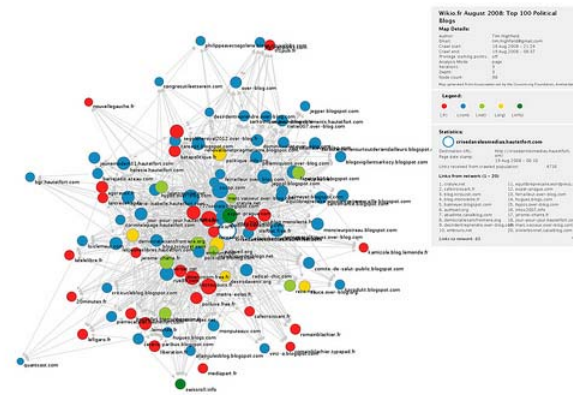## Introduction: The problem with mapping the blogosphere

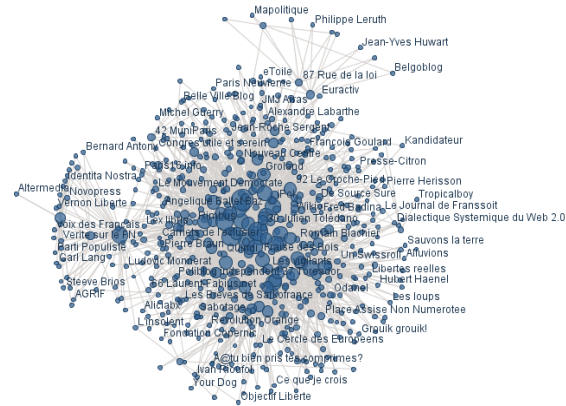**Figure 1** *(left)*: *map of the French political blogosphere created through* IssueCrawler.[1]

Figure 2 *(right)*: *map of the French political blogosphere depicted through* ManyEyes.[2]

Figures 1 and 2 are both experimental maps of a section of the French political blogosphere, part of the "clustered network of interconnected texts" (Schmidt 2007, 1409) discussing (French) politics and either written in

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[1]   http://issuecrawler.net
[2]   http://services.alphaworks.ibm.com/manyeyes/

French or based in France or French-speaking regions. While the two maps use different methods, tools for depicting the networks, and slightly different datasets, the resulting diagrams highlight a barrier to any attempt at consistency with maps of any part of the blogosphere. As well as the different network shapes, the maps also do not provide any notion of orientation or scale, which while difficult to provide for maps of non-physical structures does restrict any comparison of different maps. Furthermore, the tool used to create Figure 2, IBM's *ManyEyes*, allows the user to regenerate and manually alter the map, manipulating the diagram to produce a visualisation that may reflect the researcher's own ideas rather than a mathematical arrangement.

However, while there are several challenges and issues immediately evident with attempting to map the blogosphere, the exercise itself is not futile. In this paper, the importance of maps to digital, virtual, and fictional spaces such as the blogosphere will be examined. In doing so, a brief history of attempts to chart online space will be featured, from maps of the internet to those of sub-sections of the blogosphere, demonstrating how approaches to both methodology and visualisation have changed over time. An investigation of previous blog-specific studies will also be carried out, evaluating the challenge of presenting both geographical and online location for blogosphere cartographers who, while researching similar spaces, represent their data in various formats. Finally, the paper will attempt to demonstrate that the creation of maps of non-physical spaces is an important output of research and also a crucial step for researchers themselves, helping to orient their studies, organise thoughts, and provide further information about the space under consideration.

Mapping the "unmappable"

Although there are several possible approaches to mapping the blogosphere, or the internet in general, based on such properties as geographical origin, network, or platform, any resulting map is useful. Regardless of the intent of the map, be it showing the distribution of bloggers in the U.S. (Lin and Halavais 2004) or the links between different parts of the political spectrum (Adamic and Glance 2005; *linkfluence* 2008), the importance of the

visualisation should not be lost. In dealing with an online space, featuring at its most inclusive at least 100 million blogs (Hirshberg 2007), ignoring the media, government, entertainment, and other non-blog sites linked to and discussed by bloggers, visualisation provides some idea of the overall structure of the blogosphere. Furthermore, with many blog studies dealing with sub-sections of the blogosphere, often with particular boundaries chosen by the researcher, having a map not only shows the sites included in the study, but also helps to clarify where are the limits to the sample. Other advantages of mapping depend on the nature of the study, but can include showing how blogs and media sites interact, or indeed how blogs interact with each other, whether particular areas or demographics are over- or under-represented within a particular blogosphere, or how information flows between blogs. Furthermore, it is important to note that charting the shapes, clusters, and networks of imagined or non-physical worlds is not an internet-specific phenomenon or problem. In addition, even in traditional, geographically-oriented cartography the maps created may represent the work of the cartographer, or the group commissioning the map, rather than any physical reality.

Mapping an unknown territory such as the blogosphere is an important step for researching that territory. As Krebs remarks, "in cyberspace, the context of the social space you're embedded in is missing. A map can help orient you" (in Abrams et al. 2006, 72). The act of mapping does not just identify features, communities, or the topography of the territory. For van Weelden, maps are "interfaces between knowledge and experience" from which "we can extrapolate from what we know to what's possible, what's not yet accomplished" (2006, 26). In an environment that may experience rapid change, such as the blogosphere or the internet in general, a map can thus highlight what is already known and what still needs to be further investigated. The importance of the unknown to a map is built upon by van Weelden, who describes a map's value as "its potential to generate a vision for attacking the *terra incognita* it portrays – not just literally, in uncharted white space, but also metaphorically, in an abstract space" (2006, 26). However, it is important to remember that "maps are social constructions rather than depictions of an objective reality" (Etherington 2007, 1). Any map reflects the purpose or context for which it was intended more than any

physical reality, and this remains true for maps of fictional, digital, or virtual places.

Of course, Stiebel and Etherington's notion that "every map is in certain respects a fiction" is not restricted to fictional maps (2007, 41). Maps in everyday use distort geographical realities, from Harry Beck's electrical circuit-inspired London Underground train map and its global replications, to the Mercator projection on world maps, for which the size of landmasses is a secondary concern to finding the shortest route for ships across oceans (Dorling and Fairbairn 1997, 44-53). In this sense, any concerns about representing non-physical spaces on a map may be diminished, for if there is no 'right' portrayal of the internet, for example, then any approach may be valid. Furthermore, Stiebel and Etherington, in studying fictional maps, describe the map accompanying Haggard's (1885) *King Solomon's mines* as "a powerful mental marker and spur to the imagination", and this can be ascribed to other charts and maps, not least other representations of 'unrepresentable realities' (2007, 43).

However, the actual process of mapping a space such as the blogosphere may not share many traits. Indeed, Packwood advises that avoiding cartographic conventions may be needed for internet-focussed maps (2004). Although Druaux's map of the French-language blogosphere (2007, Figure 3) is clearly inspired by older cartographic traditions, adding in artistic details in the style of Swift's African maps featuring "elephants for want of towns" (1733), and other, comic maps such as that by Munroe (2007) also attempt to reconcile a geographical representation with digital communities; Packwood sees maps of networks, based on links and traffic, as better ideals for charting the blogosphere (2004). Further, using online tools to map the blogosphere has implications for the map itself; Packwood claims that "any attempt to map the Internet using the Internet as a medium changes the thing it sets out to represent", and the constant change online means that "maps of the Internet are out-of-date even as they are inferred". A blogosphere map may capture a moment in time, rather than providing a definitive, relevant overview of the network, but to do so Packwood suggests focusing on the flows, of links, information, and site visitors, rather traditional cartographic methods. Several previous maps of the internet and parts of the blogosphere have attempted to use these features as the basis for their depictions (for example, Kelly and Etling 2008; Hurst 2006), and in the following sections these approaches to

mapping the internet and the blogosphere will be evaluated with a view to further studies of online networks and communities.
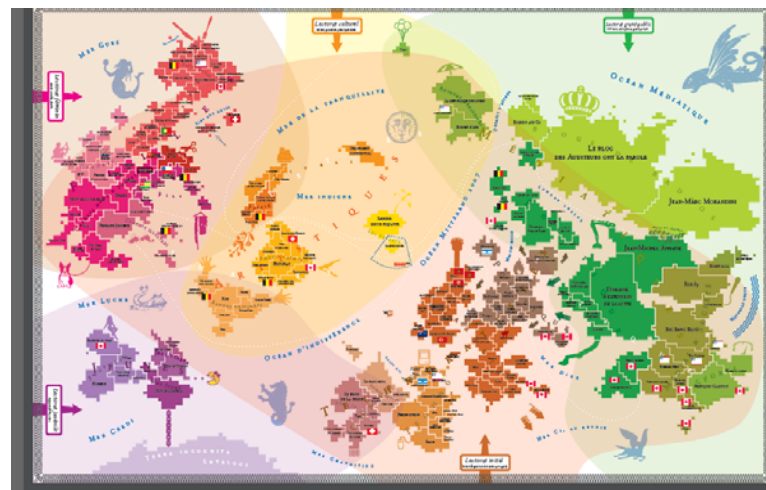

Figure 3: *'highly subjective' map of the Francophone blogosphere* (Druaux 2007)

Mapping the internet

Visualisations of the internet have been, for historical reasons, more widely-developed and documented than more specific maps such as those of the blogosphere (for example, Dodge and Kitchin 2000; Abrams and Hall 2006). Dodge (2008) suggests three different modes of internet, and wider cyberspace, mapping: maps in cyberspace, maps of cyberspace, and maps for cyberspace (72). Of these, the exercise of mapping the blogosphere fits into the second mode, being a visualisation of a part of cyberspace rather than a more 'traditional' format put online or a means for navigating the blogosphere. For any map *of* cyberspace, Dodge offers a definition of the form as "any visual image that facilitates the spatial understanding of the physical makeup and operation of cyberspace itself", which can then be adapted to the subset of cyberspace being mapped (77). These maps range in appearance from network maps to statistical diagrams and infrastructure

charts, but, as is also true for blogosphere maps, these different approaches are all valid and reflect different cartographic purposes.

Abrams and Hall provide several examples of internet maps, including Lyon and the Opte Project's *Map of the Internet* (2003) and Cheswick and Burch's 1999 *Map of the Internet, color-coded by IP address* (2006, 30-31). Both of these maps are visualisations resembling trees, with branches and nodes organised by algorithms rather than geographic locations. Indeed, the Cheswick and Burch map is "projected within abstract space because as Cheswick notes: 'We don't try to lay out the Internet according to geography ..... The Internet is its own space, independent of geography'" (in Dodge 2008, 137). Other maps of the internet are based on 'crawling' or scanning the internet, using automated tools to follow links and searches and record data on the sites and domains found, such as that created by Coast in 2001 (in Dodge, 84). The automated crawls also influence blog mapping, seen in such visualisations as the issue crawls used by Bruns (2007). Further examples of internet maps are based on online activity (Cooperative Association for Internet Data Analysis 2003, in Abrams and Hall 2006, 32), or overlay internet data and statistics onto physical maps of the world; for example, the visualisation of internet traffic by NSFNET (in Dodge 2008, 128).

Maps of the internet provide both methods and visualisation styles that may be influential for projects such as mapping the blogosphere. However, the process is not without its problems. As van Weelden (2006) notes, "the challenge is not just that it contains a staggering amount of extremely complex, rapidly-changing information, but also that it exists nowhere and yet operates simultaneously in the physical world. To be more precise: the Internet produces a new type of space-time that bears a loose and flexible relationship to the physical world" (26). Although blogosphere maps focus on a smaller amount of data than whole-internet maps, concerns of the wealth of information and the rate of change within the system are particularly pertinent. Nevertheless, with maps being "rhetorically powerful graphic images that frame our understanding of the human and physical world, shaping our mental image of places, constructing our sense of spatial relations" (Dodge 2008, 29), their importance for research into digital and virtual realms is significant, and even with the rapidly changing nature of content and sites on the internet, maps of these structures can still act as snapshots, depicting the networks concerned at a particular moment in time.

Van Weelden (2006) suggests one further frontier to successfully mapping spaces such as the internet: the reconciliation of the digital and social or physical worlds. While some of the maps mentioned previously combine geographical and digital data, for van Weelden the digital and social divide extends further. Indeed, van Weelden claims that "as soon as this dilemma is acknowledged, the task ceases to be just a matter of intelligently visualizing the traffic of bits. Rather, it becomes a question of graphically visualizing the Internet as a specific part of human society" (27). For this reason, projects may be advised to use a network mapping approach, as it "focuses our attention on the reciprocity between digital and physical-social worlds" (29). However, internet and blogosphere maps, even with network mapping methods, may still not be entirely successful at combining digital and social data.

Maps of the blogosphere

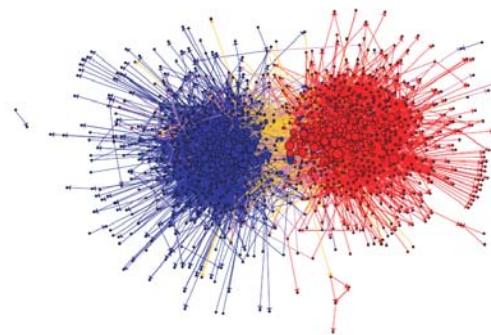**Figure 4** *(left)*: *map depicting geographical distribution of U.S. blogs* (Lin and Halavais 2004)

Figure 5 *(right)*: *map depicting liberal and conservative blogs in the U.S. around the 2004 U.S. presidential election* (Adamic and Glance 2005)

As with maps of the internet, attempts to map the blogosphere also have to deal with the physical and digital aspects of the territory. The cartographic *terra incognita* of the blogosphere and its evolution over the past decade have meant a range of mapping approaches. For example, Figure 4 shows the geographical distribution of a sample of blogs from the U.S., ignoring their online links and instead grounding them in their physical location (Lin and Halavais 2004). Figure 3 combines aspects of traditional cartography with a fictional arrangement in mapping a sample of major French-language blogs, organised thematically and with their size on the map dependant on the activity of the blog (Druaux 2007). Finally, Figure 5 maps liberal and conservative political blogs in the U.S. around the 2004 presidential election, showing the clustering and linking behaviour on both sides of, and across, the ideological divide (Adamic and Glance 2005). While all three maps attempt to show different aspects of the blogosphere being studied, the different approaches used mean that, as with any 'traditional' mapping exercise, it is important for any researcher looking at creating further maps to decide exactly what kind of information is to be portrayed.

For the research at hand, the focus is on tracking information flows and linking patterns between blogs and news media sites. As such, an approach similar to Adamic and Glance's map is the most apt for this investigation. However, the other methods shown above may also be useful later, for demonstrating the physical distribution of bloggers or an alternative way of visualising the networks and communities within the blogosphere.

Regardless of the purpose of any blogosphere map, the map itself does help to orient the researcher or reader within a digital space (Abrams et al. 2006, 72). However, while the entire process of mapping the entire blogosphere, or a subset thereof, is a valuable exercise, it does come with its own caveat. As Donath remarks, "maps make data appear definitive", when often the data involved is not as thorough as might be expected (in Abrams et al. 2006, 77). To return to Figures 1 and 2, at the start of this paper, neither map can claim to be a completely inclusive overview of the French political blogosphere. Instead, the two maps take as their starting points a ranked list of the top 100 political blogs, published monthly and determined by a search engine by measuring incoming links over a 120 day period.[3] As the map in Figure 2

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3   http://www.wikio.fr/blogs/top/politique

was created using the May 2008 list, and Figure 1 using the August 2008 list, some differences between the maps would be expected. However, the risks of bloggers abandoning their sites, or closing them down, or even just asking to be removed from the ranking lists, means that the sites included in a sample such as those in Figures 1 and 2 are often changing. As such, Krebs' suggestion that "… a warning label- DATA IS PARTIAL AND MAY BE OUTDATED – is necessary in most network maps", is particularly valid in this case (in Abrams et al. 2006, 78).

The partial nature of data in maps of blog communities is reflected in the boundaries to the sample of sites used to create the map. As no one platform dominates and there are no 'frontiers' between international blogs, languages, nationalities, themes, and cultures mingle or undergo self-isolation. While this situation has positive consequences for spreading information, opinions, and products around the globe, and enabling disadvantaged or engaged people to put their voice online freely, it also means that national distinctions are harder to apply to internet-based communications. An 'Australian' blog may be based in Australia, or written by an Australian, or written *about* Australia. 'French' blogs may be even harder to define; does every blog written in the French language qualify as 'French', or should French-language blogs from Belgium, Senegal, Switzerland, or other French-speaking regions be excluded? What about blogs written by French people, in France, but about international topics? In addition to affecting the sample of sites used, these decisions may also impact upon any potential geographical representations of the data involved.

Having created a list of sample sites, network maps such as those created by Adamic and Glance (2005), Kelly and Etling (2008), or Bruns (2007) may use automated tools to follow links and save content and other data for further research. These tools may find additional sites that may be relevant to the research, and, given the likely partial nature of the sample to begin with, adding sites to the sample for further data gathering purposes is advised (Bruns et al. 2008). However, the method is not without its problems.

While creating a map such as those by Adamic and Glance (2005) or Bruns (2007) finds the general content of blog posts to be of secondary importance to the links coming in or out of the blog itself, the *type* of link is even more significant, and may also not be distinguished from other types of link by the

automated tools being used. Although Zuckerman (2008) mentions that "links are perhaps the most useful metric for measuring the influence of international blogs and the interconnection of local and global blogospheres" (51), not all links are crucial to the mapping process. Bruns et al. (2008) describe four different types of links found within blogs: generic, blogroll, topical, and commenter-provided links, of which only the blogroll and topical links reflect the interests, sources, or activities of bloggers. The generic links may include advertisements or site navigation links, and as they may be created without blogger involvement such links may distort the data being used, as may the presence of spam blogs within the network (Thelwall and Stuart 2007). Commenter-provided links exhibit more agency, but are often links made by other readers of the blog and may reflect rather different intentions to the original blog post.

The different types of links have influenced various blog studies and maps. Topical links in blogs, including citations made in blog posts (Adamic and Glance 2005, 4), form the basis of Adamic and Glance's A-list network visualisation (8) and Bruns' crawls of blog discussions about David Hicks (2007). However, the latter study had link differentiation problems, as the tool used for the latter study did not distinguish between subsequent topical or generic links. The same tool, IssueCrawler, was used to generate the map in Figure 1, and the ability to use only one kind of link is still an issue to be resolved for further maps. Blogroll links have been treated differently by the various mapping projects: although providing lists of links to blogs displayed separately to blog posts (Adamic and Glance 2005, 3), provide more permanent links than in-post citations, reflecting sites "of lasting interest to the blog author" (Bruns et al. 2008, 2), blogrolls may be left by bloggers without being updated over time, becoming 'stale' and less reflective of the blogger's interests (Adamic and Glance 2005, 4;6-7). Furthermore, although Packwood (2004) describes the "coveted permalink connecting one blog to another in its entirety", linking is still a choice made by bloggers, and while one blog may link to another, a reciprocal link may not always be forthcoming, while some blogs may not have blogrolls, further affecting the shape of the resultant blog network. Ultimately, as Hargittai et al. (2008) find, "while blogrolls are one indicator of the types of content with which bloggers engage, it would be too simplistic to rely solely on such information for an understanding of bloggers' reading habits" (85).

At the same time, while Bruns et al. (2008) repeat the need to distinguish between links and remove those that are unrelated to the study at hand and Adamic and Glance (2005) mention the influence of blogroll links on their data and the need to remove blogrolls from some samples, it would not be ideal to exclude all blogroll links from a blogosphere mapping exercise. Blogrolls may become stale, and not all blogs may have blogrolls, but they are still clear links from one blog to another, demonstrating friendship, shared themes, or interest, and are important structural features of blogs. In Figure 2, the map of the French political blogosphere is based upon the blogroll links from the 100 sampled blogs, and even without all blogs having blogrolls, the map highlights some particular ideological and regional clusters. As such, through their permanence and structural function, blogroll links can be important sources for any blog maps.

However, the very permanent nature of the blogroll link, an example of Packwood's "coveted permalink" (2004), may also be too limiting for any map. Holmes mentions that "the weakness of …[social network analysis] studies is precisely to focus on what sociologists call 'strong ties' – eliminating the play of chance encounters and the insurgency of events that continually reshape social existence," and a focus on blogrolls may indeed de-emphasise the importance of weak ties, in the form of in-post citations, to the blogosphere (2006, 24). As such, for a study of information flows, a combination of blogroll links, as in Figure 2, and issue-based maps, as in Bruns (2007), would potentially create an ideal map. A blogroll-based map would highlight the wider network at a particular moment in time, the issue-based map, overlaid on top of the wider network, would help to show the information flow through the network, based around a particular topic or event. However, creating such maps is a challenge. Attempts at using IssueCrawler to create maps of blogs based around issues, while drawing some maps of sections of the blogosphere, have not been particularly successful in limiting the map to the intended network. Indeed, in one case, the major sites in the network were portals or advertising pages. In addition, any map created using one tool is unlikely to be similar to that created with another, making the overlaying process a probable combination of automated data acquisition and manual mapping. Yet, as the field is further researched, the tools and methods available to researchers may become more advanced

and adaptable for these purposes. By then, of course, the shape of the blogosphere may have changed substantially, and it may be time for a new map anyway.

Conclusions

Attempts to map the blogosphere, or sections within it, have varied in their scope and intentions, creating a range of methods and types of map available to researchers in the field. In trying to depict the flow of ideas and information across a blog network, a mathematical basis is an ideal starting point for any visualisation of these flows, especially given the amount of data available. However, as with any map, the resulting visualisation may not accurately reflect the space intended, but rather the functions or behaviours of the tools used or the intentions of the person or group creating the map. As such, some manual involvement is required to create a map reflecting the original purpose of the exercise. When mapping a non-physical space such as the blogosphere, with case-specific boundaries and sites, manually checking points within the sample for consistency and accuracy is even more imperative. While any map of the blogosphere will not be completely accurate, due to the ever-changing nature of blogs and the amount of data available to researchers, for any map to be as accurate as possible a combination of previous methods and tools is required. This paper has outlined one possible method for mapping information flows within the blogosphere. However, due to the nature of tools available, it remains to be seen how successful this method will be, and indeed how much automated mapping will be useful and to what extent manual involvement will be required. The blog studies field is still being developed, with research from different disciplines and perspectives helping to shape future work. With mapping the blogosphere still a rather tentative process, any experiments and cartographic tests are still useful in understanding how such an exercise may be undertaken, and the challenges and limitations facing any work in this area.

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