**Guest Editorial - Visualizing urban and regional worlds: power, politics, and practices**

In 2009 EPA launched its featured graphics section reasoning “[m]ore and more of the way the world is communicated takes place through graphical means and journals need to reflect that development” (Thrift, 2009 page 763). Six years on developments in computing, visual methodologies, analysis and communication have proved the decision to publish academically informed graphics well timed. Today more visualisations are being created for larger audiences than ever before, but importantly they are being produced with new techniques and by new actors, within increasingly complex scopic regimes. The New York Times, The Guardian, The Economist, The Financial Times, Le Monde, O Globo and many others, have embraced (interactive) infographics as a medium to communicate the most important news stories in the past few years. Governments are also leveraging the power of graphics: read a government report and you’ll find it filled with charts and diagrams depicting budgets and performance. For enterprises (social and commercial), graphics form major parts of annual reports and share prospectuses. In their advertising, too, charts inform customers of the life enhancing efficiencies their product will bestow on consumers. And tech companies are treating data like the new oil.

It is important, therefore, we understand the politics, power and practices of visualisation within this information political economy. This special issue does so through the prism of cities and regions. This focus is both timely and compelling for two interconnected reasons. First, cities and their hinterlands are special - they have ‘triumphed’ over other forms of human settlement (Glaeser, 2011) and the 21st century has been declared the century of the city with urban populations predicted to account for 70% of the world’s population by 2050 (Burdett and Rode, 2006). Second, the confluence of big data and smart city agendas has seen cities visualized anew. ‘Urban data scientists’ working in city labs, urban data centres and smart city hubs are using proprietary software and algorithms from technology giants to create dashboards and real time models of urban centres (Mattern, 2013, 2015; Kitchin et al., 2015). New questions are raised, therefore, about the role of different actors in the production and dissemination of visualisations, the empirical basis for city models and maps, who and what is included and excluded from visualisations, the potentialities visualisations hold, and how we should conceptualise them.

To help address these questions we invited contributions from previous featured graphics authors. The contributions comes from scholars working in architecture, geography, economics, environmental science and planning, and present work which visualize cities and regions through modeling, mapping, deconstructing, drawing and doodling them. Contributions include traditional papers, featured graphics (and extended versions) and commentaries. We encouraged contributions which were visually rich, at the expense of words, to make this issue a feast for the eyes. A series of interrelated themes can be identified amongst the work published in this special issue.

**The Power and Politics of Visuals**

Vision is our most powerful sense and it is through sight that most people come to know and experience their worlds firsthand. Visual depictions of unseen or abstract phenomeona are powerful, too, because of their ability to simplify and clearly show patterns, trends and (dis)associations. Visualisations are a tool, therefore, for telling stories about the world and ideas which shape it. Through processes of information collection and analysis, and design and dissemination of graphics, layers of implicit authority are added to visions of the world through the implicit assumption the designer is an expert in collating, manipulating, and presenting information (often using *specialist* software). Further, Gray et al suggest “unlike other visual media… [visualization] is deeply rooted in measurable facts…it is less emotionally charged, more concerned with shedding light than heat” (2012: online). This is reinforced by reproducing themes and techniques adopted by the sciences and computing, disciplines which seek ‘truths’ built on facts.

But implicit and explicit claims to objectivity and infinite vision (Haraway, 1988) hide the politics of scopic regimes (Metz, 1982; Feldman, 1997) married to disenfranchising and discriminatory technologies. Visualisations are mediations in the truest sense of the word: “they speak for others that have been deprived of a voice, that have been transformed from objects that spoke for themselves into mere shadows of their former selves…not only are the voices taken away, but the memory that they might have spoken otherwise has been lost” (Law and Whittaker, 1988: 179).

As Rose (2015) discusses, the agents transforming and generating visions of cities may not be best placed to unpick the subtle politics of the visual methodologies they are employing to literally revision cities and the lives of the people who live in them. Indeed, despite excellent critiques of these movements from social scientists (Crang and Graham, 2007; Gabrys, 2014; Shelton et al., 2014, amongst others), the disciplines with the most to say about the lives of cities and their surrounds are missing from the boards and panels setting agendas (Rose, 2015). Alternative views are important not simply because there is a long history of understanding cities in the humanities and social sciences, but because scholars in these areas see and understand how the world is constructed in a plurality of visions. Debates about quantitative methods in geography, and the dialogue within GIS about the politics of new mapping methods, are just two areas from which fruitful discussion of the dangers of single visions of the world have emerged.

The papers by Graham and De Sabbata (2015, in this issue) and Arribas-Bel and Gerritse (2015, in this issue) focus on the role of visualization in communicating and shaping views of the world. Graham and De Sabbata discuss the ontological powers of Gazetteers in determining geographic (in)visibility. The researchers emphasize that, by serving as ‘definitive’ sources of placenames, gazetteers play a gatekeeping role in shaping the digital representation of places. More specifically, it is argued that gazetteers could influence which placenames and, by extension, places would and wouldn’t be encoded, geocoded, visualized and understood. GeoNames gazetteer is examined in this article to demonstrate the uneven geographies of placenames and the politics of this information inequality.

Aiming to make sophisticated (economic) analyses accessible to non-technical audiences, especially policy makers, journalist, and students, Arribas-Bel and Gerritse devise a new visualization technique: *storyboards*. Comparing with previous methods, this new technique avoids the pitfalls of only looking at averages and the inability to infer causal relations. *Storyboards* are applied to reveal the economic dynamics that shape urban successes and failures in the US.

**Data, data everywhere?**

These contributions demonstrate the importance of data for visualisation, and illustrate that in an era of supposed ‘big data’ gaps remain in what can and can’t be visualised. Nonetheless, big data do provide new opportunities for visualisation. Indeed perhaps the most striking recent work is linked to the big data movement. Assumptions about (too much of) this data, however, are revealed in the naïve claims by Mayer-Schonberger and Cukier (2013: page 6): “[t]he fruits of the information society are easy to see, with a cellphone in every pocket, a computer in every backpack, and big information technology systems in back offices everywhere.” The claim of data omnipresence is clearly false, but Morozov (2013) argues it is having profound impacts on how the world is understood by technologists and data fanatics. He argues solutionism – a kind of instrumental rationality – dominates the approaches of big data users with the effect of “recasting all complex social situations either as neatly defined problems with definite, computable solutions or as transparent and self evident processes that can be easily optimized if only the right algorithms are in place” (p24).

Perhaps the best example of solutionism is the so-called smart or intelligent city concept which sees cities quantified through smart grids, user-generated data and integration of databases about a city’s citizens. This approach to ‘city as machine’ has been critiqued decades ago (Mattern, 2013), but the lure of aesthetically pleasing depictions of efficiently functioning cities is influencing policy makers around the world. The datafication process, and the solutions it promises, however, generates assumptions about what a city is, how it should function, and in turn, and for whom it should function.

The papers by Charlton et al. (2015, in this issue); Liu and Wang (2015, in this issue); and Swords and Jeffries (2015, in this issues) shed lights on various aspects of the datafication process. Charlton et al. investigate the linking and assimilation of digital urban data. More specifically, the authors explore how virtual city models can be integrated with pedestrian traffic movement, noise levels and microclimates data generated from multiple urban simulation softwares. This methodology could facilitate visual and performance assessments of city plans and is illustrated through a case study of proposals for a new city centre space in Newcastle upon Tyne, UK.

While social media data have oftentimes been criticized for producing biased and partial reflections of the reality, Liu and Wang present a unique case of the Chinese social media site Weibo to harness such biasness. With most of Weibo’s users being ethnic Chinese, this paper demonstrates the usefulness of geotagged Weibo data in estimating the geographical distribution of overseas China at finer spatial scales.

Focusing on the wider Tyneside region, Swords and Jeffries explore the everyday experiences of people whose use of the city is not easily datafied, and are often absent from planned uses. Working with doodles of the city made by skateboarders they explore how lo-fi visualisation methodologies can reveal just as much, if not more about how a city can function for particular groups of citizens than cutting-edge technology. Using recent developments in post-representational cartography they chart the creative tensions of creating a mappa mundi of Tyneside’s skatescene.

**Visualisation in Practice**

More data and new technologies offer novel ways of visualizing processes generating urban and regional worlds. This is the starting point for the final three papers which focus on the practice of visualisation.

The visualization of spatial networks is oftentimes plagued by the networks’ density, clusteredness, and sheer size. Derudder et al. (2015, in this issue) take up this challenge and adopt a cutting-edge graph layout algorithm to display networks on conventional maps. The new procedure is used to reveal the geographies in the world city network data collected by the Globalization and World Cities research network (GaWC).

Haudidier (2015, in this issue) critically examines the design principles behind a classic cartographic layout - ‘comparative tableau of mountains & rivers’ – and proposes a modern GIS-based emulation. The world’s longest rivers as well as the Garonne river and its estuary are used as examples to demonstrate the capacity and innovative merits of the method. Through three re-cartographies of southwest Flanders, Bieke (2015, in this issue) discusses how re-cartography entails the novel bundling and combination of conventional cartographic procedures, and argues the relevancy of (re)cartography as an urban design tool, making reference to cartography’s capabilities of expanding and reshaping designers’ visions of cities and regions.

**What next?**

The papers here illustrate the range and potential of visualisations, and critical studies of visualisation as a process. Indeed, we would argue the disciplines represented here are best positioned to draw on centuries of visualization tradition and shape an agenda for visualization which is progressive, ethically informed and theoretically robust. To end our introduction, however, we want to briefly highlight three challenges this field faces.

First, the rise of bigger datasets requires skills largely absent from the social sciences and humanities. It is in computing and data science where the most significant advances are being made. Kitchin (2013) warns of the risks for social scientists if they miss out on opportunities created by a data deluge. He highlights the inadequacy of undergraduate programmes to deliver the training required to understand and process huge datasets, and we would add that the academics perhaps best positioned to address this problems – those borne of the quantitative revolution in the 1960s and 1970s – are on the verge of retirement. In relation to visualizing data, as this issue shows, areas such as GIS are well positioned, not least as much of the data generated through the internet of things, social networking and user generated information is geographical. But it is imperative we engage with the whole process of data collection, analysis, visualization and dissemination so as not to become sidelined.

In addition, as Michael Goodchild highlights in his commentary, the technology allowing new forms of cartography to emerge is probably not the area where the most fruitful interventions can be made. It is through conceptual innovation that mapping has been refreshed in recent years and it is here social scientists can make the most significant impact. The cartograms in Dorling and Hennig’s concluding commentary prompt not only new ways of seeing the world, but new ways of considering its form and content as well.

Second, a challenge remains in how best to disseminate visual work. Journals such as Environment and Planning A, Geography Compass and the Journal of Maps have both been successful in finding space for non-written contributions, but traditional journal formats are a hindrance. Page sizes, colour printing charges, resolution restrictions and the static nature of most publications limits how and what can be included. Online versions go someway to alleviate these issues but more needs to be done to enable the publication of dynamic and interactive visualisations in academic collections.

Finally, work on visualization comes from a wide range of disciplines each with their own traditions, theories and languages in relation to visuals. Perhaps the biggest challenge this field faces is bringing together disparate groups of people to develop plural and multi-perspectival frameworks to understand visualization critically. We hope this issue has gone someway to contributing to this conversation, but it is a big job and one we hope readers will agree is important to progress.

Jon Swords, Department of Geography, Northumbria University

Xingjian Liu, Department of Urban Planning and Design, The University of Hong Kong

**Acknowledgements**

We’d like to thank all the authors who have contributed work to this issue for creating a fascinating collection of papers. We’d also like to acknowledge the help and support of Danny Dorling, who guided us through the theme issue process, and the team at EPA, particular Lisa Dam, for answering all our questions.

**References**

Arribas-Bel, D., and Gerritse, M. (2015) “From manufacturing belt, to rust belt, to college country: A Visual Narrative of the US Urban Growth." *Environment and Planning A*.

Cattoor, B. (2015). Designerly Mapping Practices at the Crossroads of Cartography and Urbanism: A Processual Account of Three Re-cartographies of Southwest Flanders. *Environment and Planning A.*

Burdett, R. and P. Rode (2006) The urban age project. In R. Burdett and D. Sudjic (eds.), *The endless city*, Phaidon, London.

Crang, M., and Graham, S. (2007) “Sentient Cities: Ambient Intelligence and the Politics of Urban Space.” *Information, Communication & Society* 10(6) 789-817

Derudder B, Hennemann S, Taylor P. (2015) "Cutting the Gordian Knot of Visualizing Dense Spatial Networks: the Case of the World City Network, 2013." Environment and Planning A.

Gabrys, Jennifer. (2014) “Programming Environments: Environmentality and Citizen Sensing in the Smart City.” Environment and Planning D: Society and Space 32(1) 30–48.

Glaeser, E (2011) Triumph of the city. Pan Books: London.

Graham, M., and De Sabbata, S. (2015). "Mapping Information Wealth and Poverty: The Geography of Gazetteers." Environment and Planning A.

Hautdidier B. (2015) "The Comparative Tableau of Mountains & Rivers: Emulation and Re-appraisal of a Popular XIXth Century Visualization Design". Environment and Planning A.

Swords, J., and Jeffries, M. (2015) "Tracing Post-Representational Visions of the City – Representing the Unrepresentable Skateworlds of Tyneside." Environment and Planning A.

Kitchin, R., Lauriault, T. and McArdle, G. (2015) “Knowing and governing cities through urban indicators, city benchmarking and real-time dashboards.”  *Regional Studies, Regional Science 2* 1-28

Liu, X., and Wang, J. (2015) “The Geography of Weibo: Where are the Chinese?” *Environment and Planning A*.

Mattern, S. (2015) “Mission Control: A History of the Urban Dashboard” Places Journal, March, https://placesjournal.org/article/mission-control-a-history-of-the-urban-dashboard/

Mattern, S. (2013) “Methodolatry and the Art of Measure: The New Wave of Urban Data Science.*” Places Journal, November* <https://placesjournal.org/article/methodolatry-and-the-art-of-measure/>

Mayer-Schönberger, V. and Cukier, K. (2013) Big Data: A Revolution That Will Transform How We Live, Work and Think. John Murray, London

Rose, G (2015) “Smart cities and why they need a lot more social scientists to get involved” accessible via <https://visualmethodculture.wordpress.com/2015/03/20/smart-cities-and-why-they-need-a-lot-more-social-scientists-to-get-involved/>

Shelton, Taylor, Matthew Zook, and Alan Wiig. (2014) “The ‘Actually Existing Smart City.’” *Cambridge Journal of Regions, Economy and Society*, 8(1) 13-25