The University Of Sheffield.

Department of Geography

Social and Spatial Inequalities Group

Geovisualization of flows: Finding new approaches to map an interdependent world

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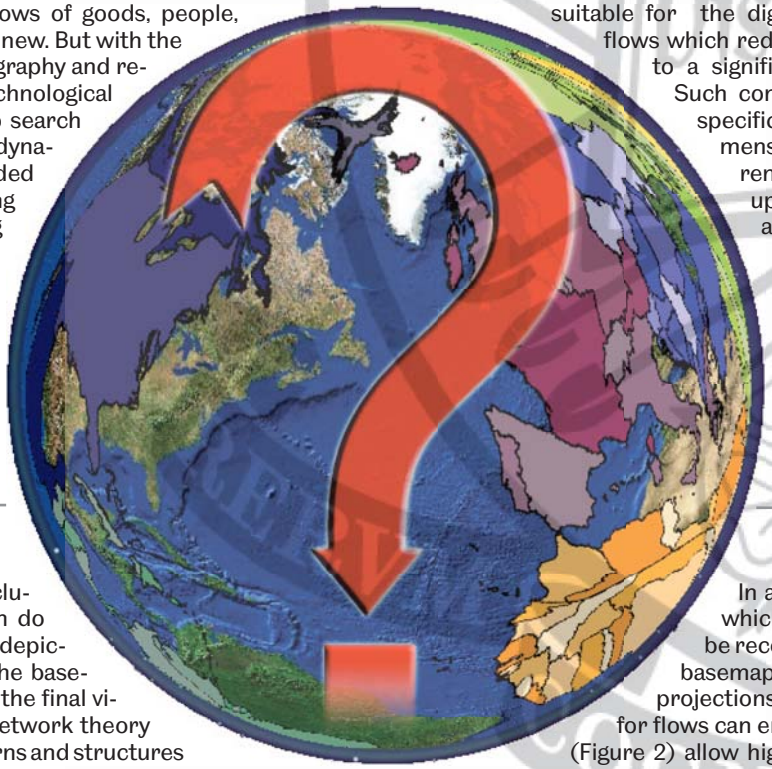
Introduction

This poster introduces a research project aiming at the development of new cartographic concepts to visualise different aspects of human geographic flows. The task of mapping social flows, such as flows of goods, people, money, or information, is not new. But with the latest developments in cartography and related disciplines, driven by technological advances, the possibilities to search for new ways to depict such dynamic relationships have expanded considerably, without leading to substantial new mapping concepts or easy-to-adapt mapping methods. At the same time, social flows have become an integral part in the functioning of our world, making maps on these issues necessary more than ever before to reveal these patterns.



Objectives

The key question of the thesis is: is it possible to effectively visualise key global flows that matter in human geography? Therefore the research aims to to develop methods suitable for the digital visualization of social flows which reduce the complexity of flows to a significant visual representation. Such concepts should consider the specific nature of the human dimension which is shaped differently than the physical space upon which traditional maps are based. Suitable solutions are not only sought within traditional cartographic methods and Geographic Information Systems but also from the domains of information visualization and visual arts which provide promising approaches to depict complex data.

Realization I

The cartography of flows includes several challenges which do not only contain the graphic depiction itself but also the way the base-data are processed ahead of the final visualisation. Concepts from network theory can help to understand patterns and structures within complex datasets and thus to simplify the flows to their essential characteristics and impacts. Basic concepts of graph theory and scientific data visualization can contribute to suitable tools that are used for spatial visualisation (Figure 1).

Realization II

In addition, the basemaps onto which flows are mapped have to be reconsidered: By using different basemaps than the usual geographic projections, different paths and spaces for flows can emerged, such as cartograms (Figure 2) allow highlighting the origins or destinations of flows. Finally, the resulting maps should be adapted to new geographic technologies: A suitable integration in online mapping environments is essential to increase acceptance and understanding of these forms of visualization (Figure 3).

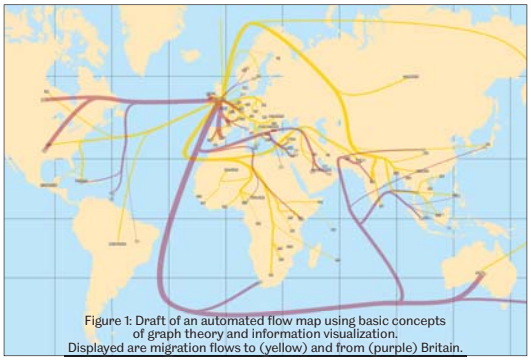


Figure 1: Draft of an automated flow map using basic concepts of graph theory and information visualization. Displayed are migration flows to (yellow) and from (purple) Britain.

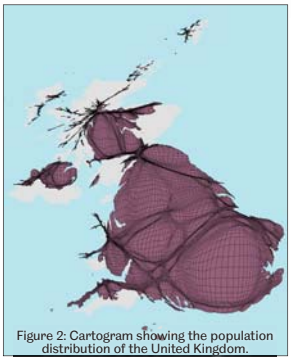


Figure 2: Cartogram showing the population distribution of the United Kingdom.

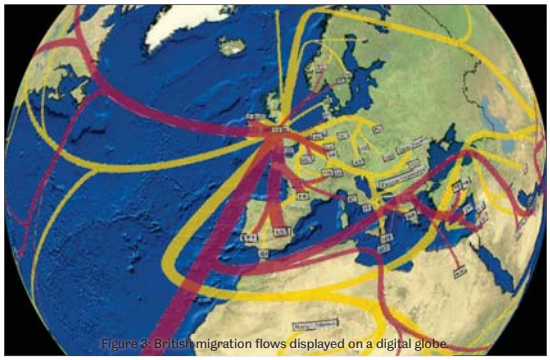
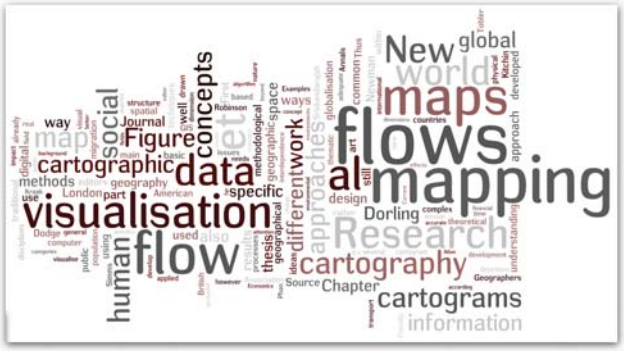


Figure 3: British migration flows displayed on a digital globe.



Outlook

Visualization of social flows in various new ways is essential to change the way we see the complex structures and interrelations of the world. These flows need to become part of a common geographical visualization as it is one essential task of geography to create a better understanding of the complex (human as well as physical) nature of our planet. If you like share your views on this topic, you are encouraged to do so. Contact me at b.hennig@sheffield.ac.uk or visit my research website at http://benhennig.postgrad.shef.ac.uk

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