



## Easy seeing

**New ways of presenting data have helped decision-making and communication across several sectors**

- **The value in large, complex and contradictory data-sets has been unlocked by researchers at City University London, through the development of new data visualisation graphics and methods**
- **This has informed decision-making for an electricity supplier, insurance broker, local council, public transport and the military**

Enabling computers to interpret massive data sets is fundamental to the modern world but having a human in the loop can be essential when the data is complex and opinion is involved in interpretation.

Instead of traditional methods of visualising data (such as bar charts and pie charts) researchers at City University London took inspiration from cartography (geographical mapping) and graphics that 'map' data that have no geographic qualities. From this they have created novel and enlightening visual interfaces that show structures and relationships between data items, making the data more accessible and comprehensible.

Transport for London (TfL) was able to interpret the pictures sourced from the data from over 20 million cycle journeys of 'Boris bikes' using the researchers' images. This revealed numerous insights such as responses to station closures and differences in behaviour between locals and commuters, cyclists in west and east London and males and females. For example, female cyclists select quieter parts of the city for their journeys than male cyclists. This has helped inform the day-to-day operation of the bike scheme as well as long term planning.

**How can we present massive and complex sets of data in ways that people understand?**



## Find out more

The value of being able to interpret giant, conflicting and contradictory datasets is understood across all sectors. Yet extracting useful insights from data can be difficult, especially when it is not clear what information to look for and what useful insights it might hold.

City University's research was part-enabled by EPSRC ICT investment, and with further investment from industrial partners and local government. Their visualisations include new designs that add information about the locations of phenomena to traditional graphics that do not contain any geography.

Adding further value, the researchers have developed a methodology for determining the types of visual graphics and interactions that are most useful for different types of data and for different tasks. This means that these visual approaches to understanding data can be applied to many uses across a huge range of sectors.

Working with Dstl, the MoD has applied the research to its analysis of data collected in areas of conflict. Interfaces to help analysts deal with the uncertainties in their data were prototyped with defence analysts and City University visualization experts who co-designed graphics. A key focus was recording the process of data-informed discovery. Graphics have been designed to help analysts bookmark and re-play their analysis and develop stories through which their findings can be used in briefings.

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[The] visualisations have been so useful for getting the message across to others in TfL and borough planning officers and have informed... the [Boris bike] scheme's expansion into south-west London and additions to the existing area

Peter Wright, Transport for London

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You could spend months searching the data for insights but this just points you straight at it.

Data analyst at E.ON, a leading energy provider in the UK

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The concepts presented ... are now central to our thinking when planning for future visual interfaces.

Leo Borrett, DSTL

## Information and Communication Technologies programme

Information and Communication Technologies (ICT) play a critical role in all aspects of our society. EPSRC's ICT Theme supports core capability in this area by investing in the delivery of high quality research, supporting excellent researchers at all stages of their careers. The Theme's investment is at the heart of UK efforts to contribute to a world-leading capability in ICT research and research training to meet the future needs of the UK.