

DURATION THIS IS A HALF-DAY TUTORIAL consisting of two 90 minute sessions.

TIME 14:00-15:30 and 16:15-17:45 on Tuesday 13th October 2009

LEVEL Beginner – no previous experience expected or required.

AIMS To help participants compare and understand design parameters in information visualization and establish best practice through the visualization of real datasets.

PARTICIPANTS The tutorial is suitable for anyone working with complex datasets who wishes to learn about the design process and to improve their data visualization skills and knowledge by considering the effects of design decisions.

OUTCOMES Having successfully participated in this tutorial you will be able to ...

- design visualization solutions from an informed perspective
- evaluate the effects that design decisions have on information visualization
- select colour schemes that are appropriate to visualization contexts
- select layouts that are appropriate to visualization contexts
- describe the effects of animated transitions between design alternatives
- use visualization to explore hierarchical data sets
- create an informed and effective hierarchical representation of your data

APPROACH Using interactive software and sample data sets we will explore issues relating to colour, layout, symbolization and animation in turn.

We will do this by introducing some key concepts and then asking you develop your own visualization designs of some sample datasets.

You will then informally evaluate your visualization designs, use them to find patterns in the data and identify research questions that they might address.

Interactively exploring the design space by varying a range of visual parameters will draw your attention to the impact of design decisions on the information visualization process and develop your knowledge of design considerations and good practice for effective information visualization design.

REQUIREMENTS You will need to bring a notebook computer with adequate battery life to participate in the sessions.

It should be capable of running Java applications and have Internet access and a Web browser as we will be downloading applications and data.

Be sure to bring a pen or pencil ... you'll need to jot down notes on the handouts.

SESSIONS	i. Introduction, Design and Tutorial Resources	14:00 – 14:45
	ii. Colour and Symbolisation	14:45 – 15:30
	iii. Layout and Animation	16:15 – 17:00
	iv. Design Effects and Data Interpretation	17:00 – 17:45

INSTRUCTORS Dr. Jason Dykes, Dr. Aidan Slingsby & Dr. Jo Wood - City University London

Overview

In the first set of activities we will download software and data, run the **HiDE** application that is provided for use in this tutorial and produce a hierarchical graphical representation of an example data set.

We will evaluate the graphics that are produced in light of some key concepts that have been introduced.

Preparation

You will need to install the **HiDE** software to visualize a hierarchical data set.

It will visualize the data according to various design decisions that you make.

You will be using the **US ELECTION** data set in this session.

Activity 1 – Download Software and Data

Download the **HiDE** software as described online:

- <http://gicentre.org/infoVis/>

Save the application in an appropriate folder on your machine.

If you are unable to access the Internet inform the instructors who have memory sticks and CDs.

Activity 2 – Load a Data Set and Produce a Graphic

Run the **HiDE** software as described online.

Initially it will enable you to visualize the **US ELECTION** data set. This contains 1,224 records relating to the 8 most recent US presidential elections. Each record relates to one of the electoral units (the 50 states and one federal district), one election and one of three voting options (Democratic, Republican and Other Parties).

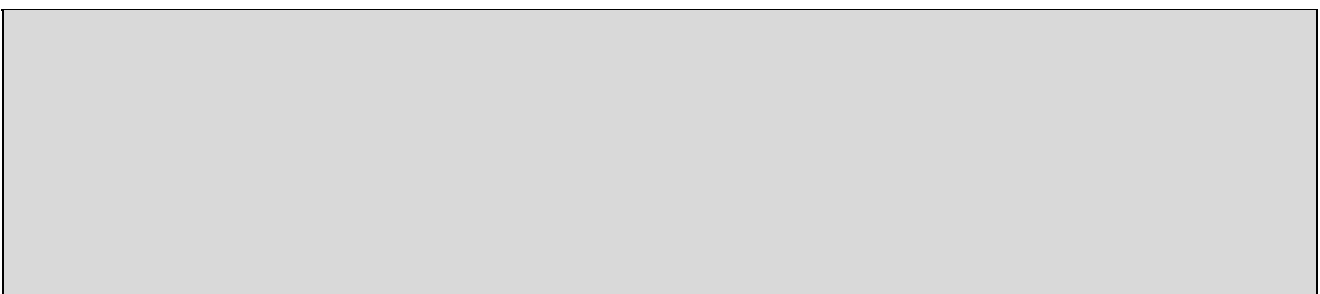
Select some variables that are of interest to generate a hierarchy.

Create a 'squarified' treemap and **SAVE** the graphic.

Size the nodes in the treemap by the number of votes at each level.

Vary the aspect ratio of the treemap by changing the window size.

How stable is the graphic when you vary the aspect ratio? What changes? Is this important?



We will now use **HiDE** to create a 'mosaic plot'.

Use alternative vertical and horizontal layout methods for successive levels of the hierarchy. Remember to **SAVE** the graphic you produce.

Vary the aspect ratio – experiment with different aspect ratios by changing the window size.

How stable is the graphic when you vary the aspect ratio?

Now consider the two hierarchical layouts that you have produced.
Compare them and record your thoughts.

How do the squarified and horizontal / vertical treemaps compare?
How stable is the graphic when you vary the layout between treemap and mosaic plot?
Are there similarities / differences or advantages / disadvantages?

Activity 3 – Evaluate the Graphics

Consider the graphics that you have produced by answering the following questions.
Be sure to use the boxes provided to jot down answers and ideas.

Which '**data channels**' are you showing in your graphics?
Are the data categorical or measurements?
If the data are categorical do the categories have relationships?

<i>Data Channel Name</i>	<i>Nature of Data or Level of Measurement</i>	<i>Relationships Between Categories (e.g. 'is a subset of...', 'is related to ...', etc.)</i>

Which '**visual channels**' are you using in your graphics to encode the data?
 Which 'data channels' do each of these relate to?
 Is the relationship between data channel and visual channel and through which you are encoding information effective?

<i>Visual Channel Name</i>	<i>Data Channel Name</i>	<i>Comments - Effective / Appropriate Visual Encoding?</i>

What might each of these graphics help you do (identify, estimate, compare, understand)?

Which characteristics of the data set can you compare effectively – which are hidden?

<i>Effective – It's easy to see and compare ...</i>	<i>Poor – It's difficult to see and compare ...</i>

Now think about whether you have learned about the data by considering these graphics.

What have you found out about the data - have the graphics given you any ideas?
 What research questions do your two graphics raise? Do they differ? If so, why?