Information Visualization
Part 2
Dianna Xu
Deepak Kumar
The Visualization Process

ACQUIRE
PARSE
FILTER
MINE
REPRESENT
REFINE
INTERACT
1. Time Series

[Graph showing US Postal Service First Class Mail Volume (in Billions) from 1950 to 2010]
2. Stacked Graph
3. Heat Map
4. Proportional Symbols
5. World Clouds
6. Map-based

October 30, 2012
6:59 am EST
(time of forecast download)

top speed: 39.7 mph
average: 8.4 mph

1 mph
3 mph
5 mph
10 mph
15 mph
30 mph
7. Choropleth Maps
8. Parallel Coordinates

- High dimensional numerical data
- PNC Christmas Price Index

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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
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## PNC Bank Price Index (2012)

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8a. Parallel Coordinates
Brushing
8b. Citeology
8c. Parallel Sets
9. Tree Map
10. Radial
11a. Tree
11b. Radial Tree
11c. Hyperbolic Tree
Focus+Context
12. Network/Graph-based
13. Chord Diagrams
Circular Layouts

• Enjoying great popularity lately
• We are drawn to circles
  – symmetry
  – aesthetics
  – perceived novelty
• Not always justified by increased readability
• Human visual perception supports only rough comparison of areas and angles
Naming Names

Roll over any candidate’s name for details.

Each thin line represents one candidate speaking the last name of another candidate.

Every line ends at an arrow, which points to the name that was spoken.

The length of each circle segment represents the total number of words spoken by the candidate during the debates. Each tick mark represents 1,000 words.

Each slice represents one debate, arranged clockwise from the first to the final debate.
Eurozone Debt Web

The circle below shows the gross external, or foreign, debt of some of the main players in the eurozone as well as other big world economies. The arrows show how much money is owed by each country to banks in other nations. The arrows point from the debtor to the creditor and are proportional to the money owed as of the end of June 2011. The colours attributed to countries are a rough guide to how much trouble each economy is in.

IRELAND

- GDP: €0.2 tn
- Foreign debt: €1.7 tn
- Foreign debt per person: €390,969
- Foreign debt to GDP: 1,093%
- Govt debt to GDP: 109%
- Risk Status: HIGH

One of three eurozone countries to so far receive a bail-out, Ireland has introduced a series of tough austerity budgets. Its economy is now showing a modest recovery. After the boom years leading up to 2008, the country fell into recession as a result of the global credit squeeze, which ended the supply of cheap credit that had fuelled the unsustainable growth in its housing market. It shows a very high level of gross foreign debt to GDP because, although it is a small country, it has a large financial sector. The UK is Ireland's biggest creditor.

Back to introduction
Data Analysis

• Unstructured data
• A lot of it
• Dimension reduction
• Cluster analysis
• Statistical methods
• Network models and optimization
• Graph theory
References

- Thorp, Jer: Your Random Numbers – Getting Started with Processing and Data Visualization
- Christian Langreiter, Tweet (@chl) at 6:10 AM on September 28, 2011.
- National Science Foundation, Core Techniques and Technologies for Advancing Big Data Science & Engineering (BIGDATA), Solicitation 12-499, 2012.
- Tweet from CS News Update at 9:54PM on May 21, 2012.
References

- Eurozone Debt: http://www.thevisualeverything.com/tag/euro‐debt/