CSE 564: Visualization

Information Visualization Toolkits

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Popular Toolkits

Infovis Toolkit
- scatter plots, time series, parallel coordinates, …

Prefuse, Flare, Protovis
- toolkits developed by J. Heer, Stanford
- prefuse: based on Java (http://prefuse.org)
- flare: prefuse + flash animations (http://flare.prefuse.org)
- protovis: javascript (http://vis.stanford.edu/protovis)
- can all run in your web browser
- declarative and data-driven

Examples

Jeffrey Heer

Protovis

A javascript user interface toolkit for constructing interactive information visualization applications

Supports visualization, animation, and interaction
- application building by stringing together fine-grained, reusable components
- layers of indirection between source data, visualized data, and rendering
System Architecture

Toolkit Features

Data structures and I/O libraries
Multiple visualizations, multiple views
Application design through composable modules
A library of provided layout and distortion techniques
Animation and time-based processing
Graphics transforms, including panning and zooming
A full force simulator for physics-based interfaces
Interactor components for common interactions
Integrated color maps and search functionality
Event logging to support visualization evaluation

Protovis

Similar to other graphics libraries such as Java or Processing
  • has mechanisms to draw rectangles, circles, polygons
  • but uses declarative syntax (not imperative)

Protovis

In Processing you might draw a pie chart as follows:

```java
for (int i = 0; i < data.length; i++) {
    fill(data[i] * 120);
    float ang = data[i] / sum * 2 * PI;
    arc(75, 75, 140, 140, lastAng, lastAng + ang);
    lastAng += ang;
}
```

In Protovis:

```java
vis.add(pv.Wedge)
  .data(data)
  .left(75)
  .bottom(75)
  .outerRadius(70)
  .angle(pv.Scale.linear(0, pv.sum(data)).range(0, 2 * Math.PI));
```
Protovis: Further Features

- Inheritance
- Property chaining
- Smart Properties
- Interaction and animation
  - smooth animations a-la Flare not yet implemented

For Lab 3

Choose any of these toolkits to implement your infovis lab assignment
Each has unique features
Check out the toolkit webpages for detailed manuals