Final Project
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Design a new visualization system or technique.

Many options…
New system for a chosen domain + data set
Novel visualization / interaction technique
Design study or experiment

Deliverables
~4 page paper in conference paper format
Milestone and design review with staff
Final poster & demo session
Divided Edge Bundling – David Selassie
Protovis: A Graphical Toolkit for Visualization

Mike Bostock
var army = pd.nest(napoleon.army, "dir", "group");
var vis = new pv.Panel();

var lines = vis.add(pv.Panel).data(army);
lines.add(pv.Line)
  .data(function() army[this.idx])
  .left(lon).top(lat).size(function(d) d.size/8000)
  .strokeStyle(function() color[army[paneIndex][0].dir]);

vis.add(pv.Label).data(napoleon.cities)
  .left(lon).top(lat)
  .text(function(d) d.city).font("italic 10px Georgia")
  .textAlign("center").textBaseline("middle");

vis.add(pv.Rule).data([0,10,20,30])
  .top(function(d) 300 - 2*d - 0.5).left(200).right(150)
  .lineWidth(1).strokeStyle("#ccc")
  .anchor("right").add(pv.Label)
  .text(function(d) d.temp+"°").textBaseline("center");

vis.add(pv.Line)
  .data(napoleon.temp)
  .left(lon).top(tmp).
  .strokeStyle("#0")
  .add(pv.Label)
  .top(function(d) 5 + tmp(d))
  .text(function(d) d.temp+"° +d.date.substr(0,6))
Perfopticon: Distributed Query Performance

Physical Query Plan:

![Diagram of a query plan with nodes labeled Fragment 2, Fragment 3, Fragment 1, ShuffleConsumer, GroupBy($0; COUNTALL), and ShuffleProducer(h($0)).]

Overview / Operators inside fragment 1

Query time contribution_BLOCK

Detailed execution

Dominik Moritz et al. [EuroVis ’15]
Visualizing Galaxy Merger Trees

S. Loebman, J. Ortiz, L. Orr, M. Balazinska, T. Quinn et al. [SIGMOD ’14]
A browser-based tool for visualization and analysis of diffusion MRI data

Jason D. Yeatman, Adam Richie-Halford, Josh K. Smith, Anisha Keshavan & Ariel Rokem
Visualizing the Republic of Letters

Daniel Chang, Yuankai Ge, Shiwei Song

Republic of Letters
1700

FILTER BY AUTHOR
- Damien Desormes
- Daniel Cornabs
- Daniel de Pury
- Daniel Defoe
- Daniel Mathus
- Daniel Marc Antoine Chardon
- Daniel Moller

TOP CITIES AND AUTHORS
- Letters received
- Letters sent

- Oates, England: 304, 250
- Dublin, Ireland: 208, 154
- Paris, France: 238, 112
- Twickenham, England: 18, 101
- John Locke: 350, 253
- Joseph Addison: 30, 244
- Voltaire: 26, 231
- Jonathan Swift: 85, 159
- Alexander Pope: 28, 150
Final Project Schedule

Proposal  Thur, May 10
Milestone  Mon, May 21 (reviews 5/22, 5/24)
Final Paper  Wed, May 30
Poster & Demo  Thur, May 31 (11:45am-2pm)

Logistics
Final project description posted online
Work in groups of up to 4 people
Start thinking about project topics!
Possible Project Ideas

Team up with **local researchers**!

Advance your **existing research**.

Pick an **open problem** of interest.

Work in a domain with **real stakeholders**.
Tips for a Successful Project

Focus on a compelling real-world problem. How will you gauge success?

Consider multiple design alternatives. Prototype quickly (use Tableau, R, etc…).

Seek feedback (representative users, peers, …). Even informal usage can provide insights.

Choose appropriate team roles.

Start early (and read the suggested paper!)
Prototype Peer Critiques
Critique Questions

What is the purpose of the visualization?
Does it serve its purpose well?
Does it convey the data honestly?
Does it show the appropriate level of detail?
Are expressive & effective visual encodings used?
Do the interactions aid understanding of the data?
Is the design well-organized? Is it innovative?
What would like to change or refine?
How might things be done differently?
I LIKE...
Praise for design ideas and/or well-executed implementation details. Example: "I like the navigation through time via the slider; the patterns observed as one moves forward are compelling!"

I WISH...
Constructive statements on how the design might be improved or further refined. Example: "I wish moving the slider caused the visualization to update immediately, rather than the current lag."

WHAT IF?
Suggest alternative design directions, or even wacky half-baked ideas. Example: "What if we got rid of the slider and enabled direct manipulation navigation by dragging data points directly?"
I Like… / I Wish… / What If?

**I LIKE…**
The goal of supporting developers to improve decoupling. The “cut-line” interaction to isolate links of interest. The use of gradients to show edge directionality.

**I WISH…**
I could author multiple cut-lines for compound queries. More details on demand were shown upon mouse-hover.

**WHAT IF?**
You could incorporate information from applications that use this code? How often are different modules used?
I Like... / I Wish... / What If?

I LIKE...
The 1D histograms on the parallel coordinates display. The use of brushing and linking between components. Attention to small details, such as white masks for axis labels.

I WISH...
Data fields were configured to focus on the most relevant features. The interaction was faster (lower latency). A color-blind friendly color palette had been used.

WHAT IF?
One tried to visualize the data using a technique other than parallel coordinates? What encodings work best for the intended audience?
Critique Categories

Visualization Design
Choice of visual encodings (expressive, effective?)
Is the appropriate information visible by default?

Interaction Design
Choice of interaction techniques
Do they enhance understanding of the data?
Usability, discoverability, performance

Overall Design Quality
Organization, legibility, fitness for chosen goals