CSE 442 - Data Visualization

Design Review & Critique

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Final Project

Final Project

Produce **interactive web-based visualizations**

Initial **prototype** and **design review**

Final deliverables and **video presentation**

Submit and publish on GitHub

Projects from **previous classes** have been:

- Published as research papers
- Shared widely (some in the New York Times!)
- Released as successful open source projects

Final Project Theme

Data Visualization for Social Good

Goal: find data of social or scientific import, design visualizations to explore or communicate it effectively.

The specific data domain is open-ended. Possibilities include transportation, housing, public health, education, climate, campaign finance, scientific research, and so on…

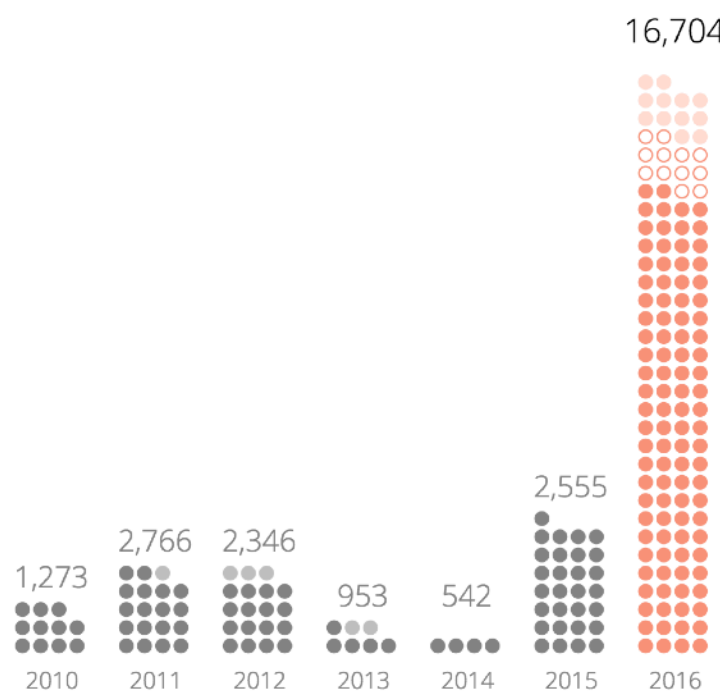You must identify a target audience. May be general (residents, voters) or specialized (scientists, policy makers).
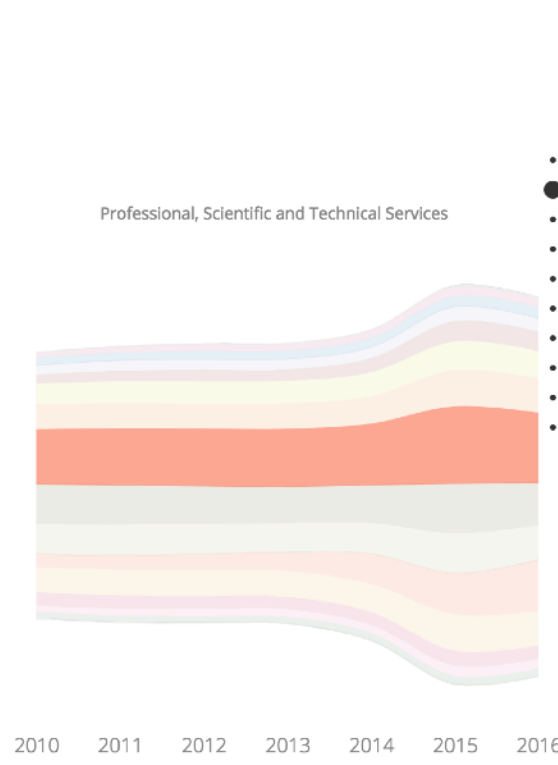
Inspiration…

Change In Times (CSE 442, Spring 2017)

Gunnar Olson, Halden Lin, Lilian Liang, and Shobhit Hathi
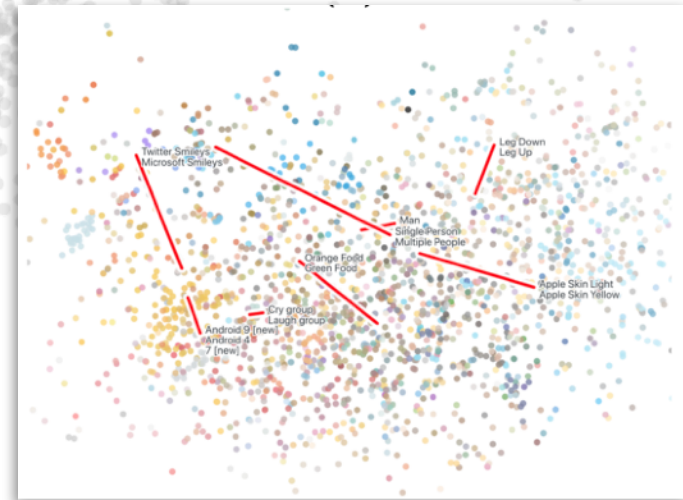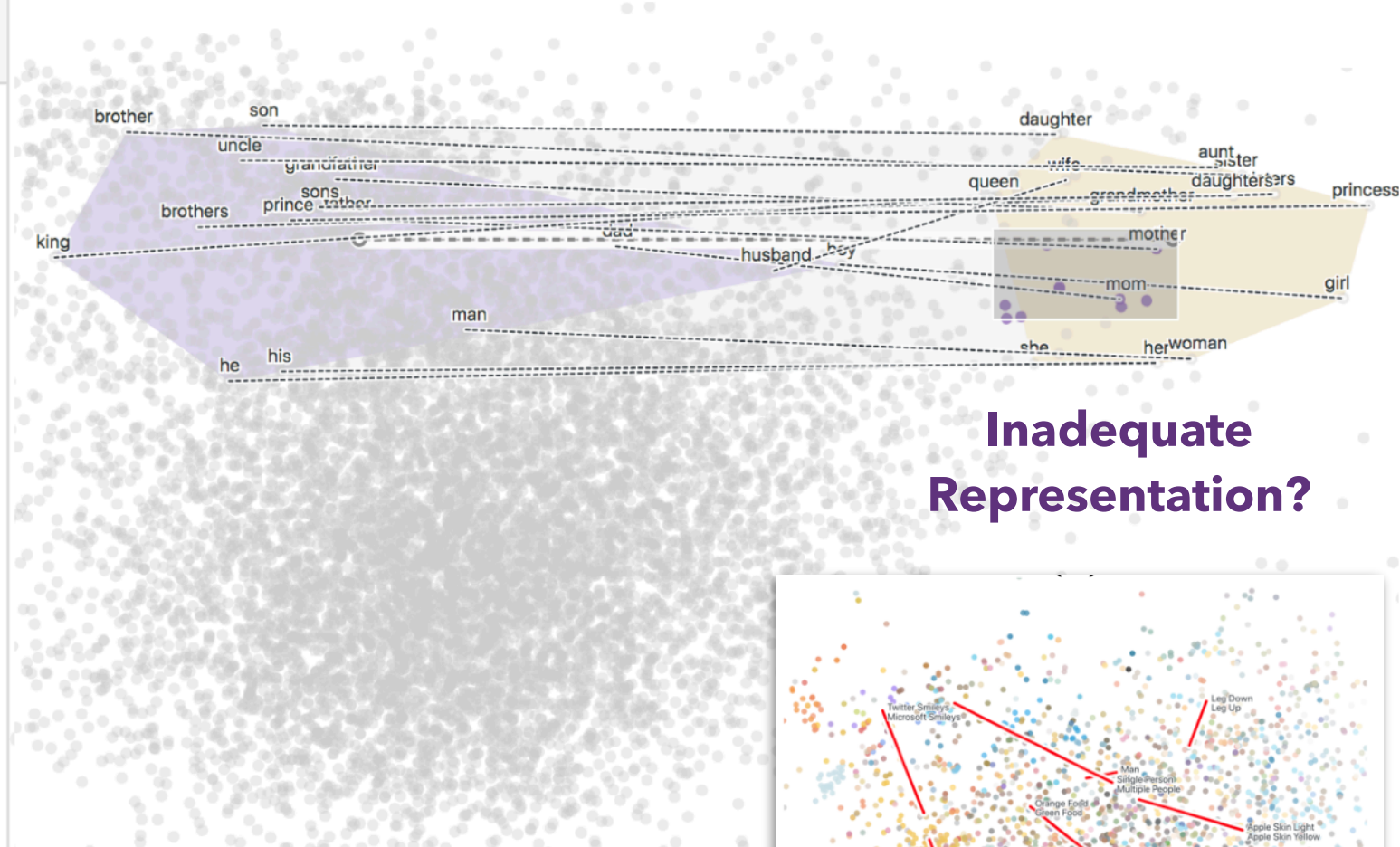
Latent Space Cartography
Visual Analysis of Vector Space Embeddings
Yang Liu, Eunice Jun, Qisheng Li (CSE 512, Spring '18)
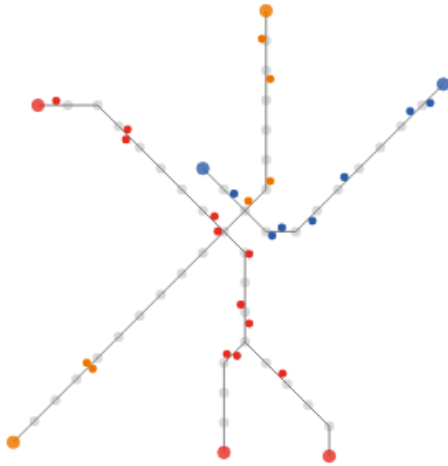
Locations of each train on the red, blue, and orange lines at 5:46 am. Hover over the diagram to the right to display trains at a different time.

Trains are on the right side of the track relative to the direction they are moving.

See the morning rush-hour, midday lull, afternoon rush-hour, and the evening lull.
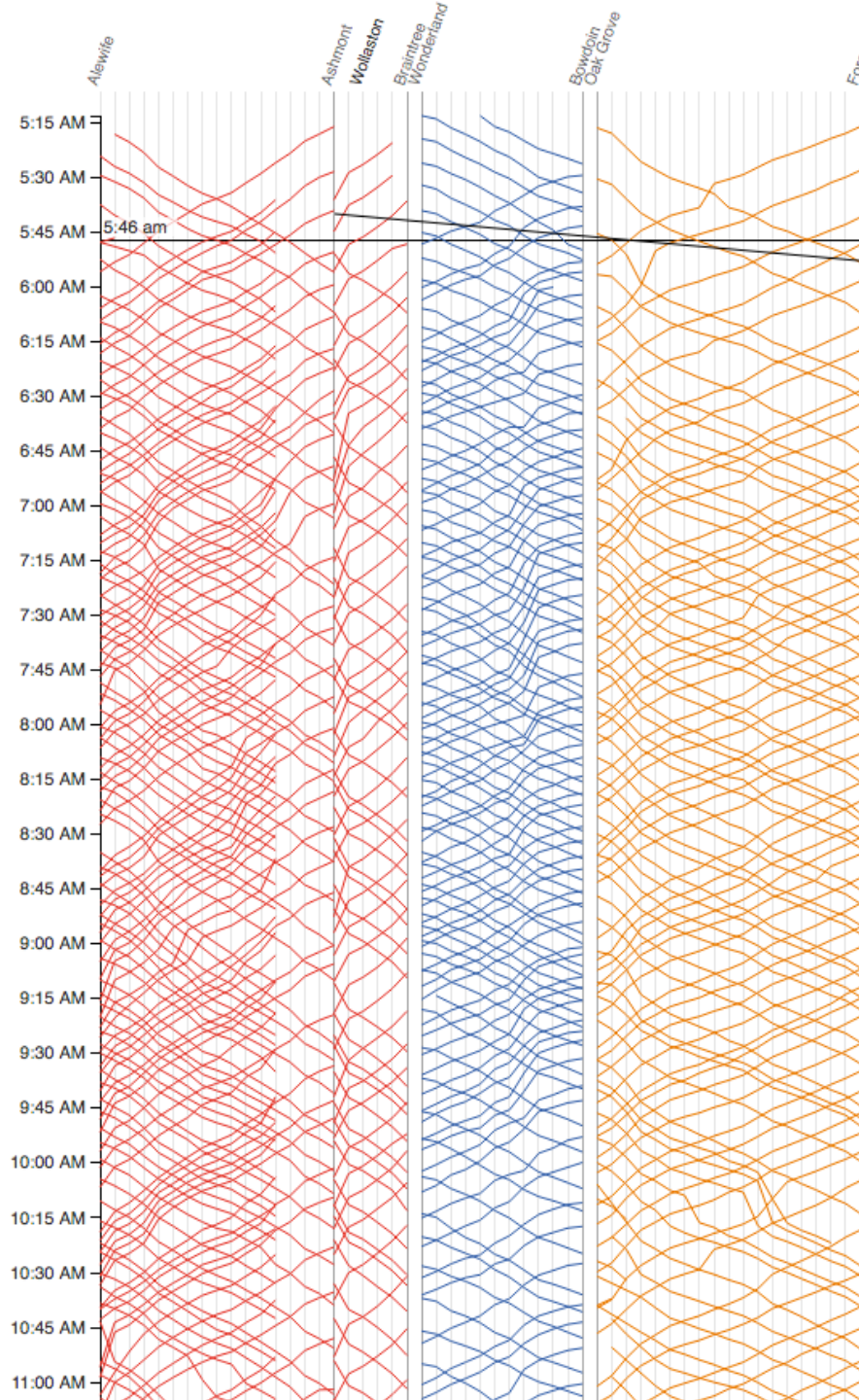
Service starts at 5AM on Monday morning. Each line represents the path of one train. Time continues downward, so steeper lines indicate slower trains.

Since the red line splits, we show the Ashmont branch first then the Braintree branch. Trains on the Braintree branch "jump over" the Ashmont branch.

Train frequency increases around 6:30AM as morning rush hour begins.

MBTA Viz

Barry & Card

Visualizing Galaxy Merger Trees
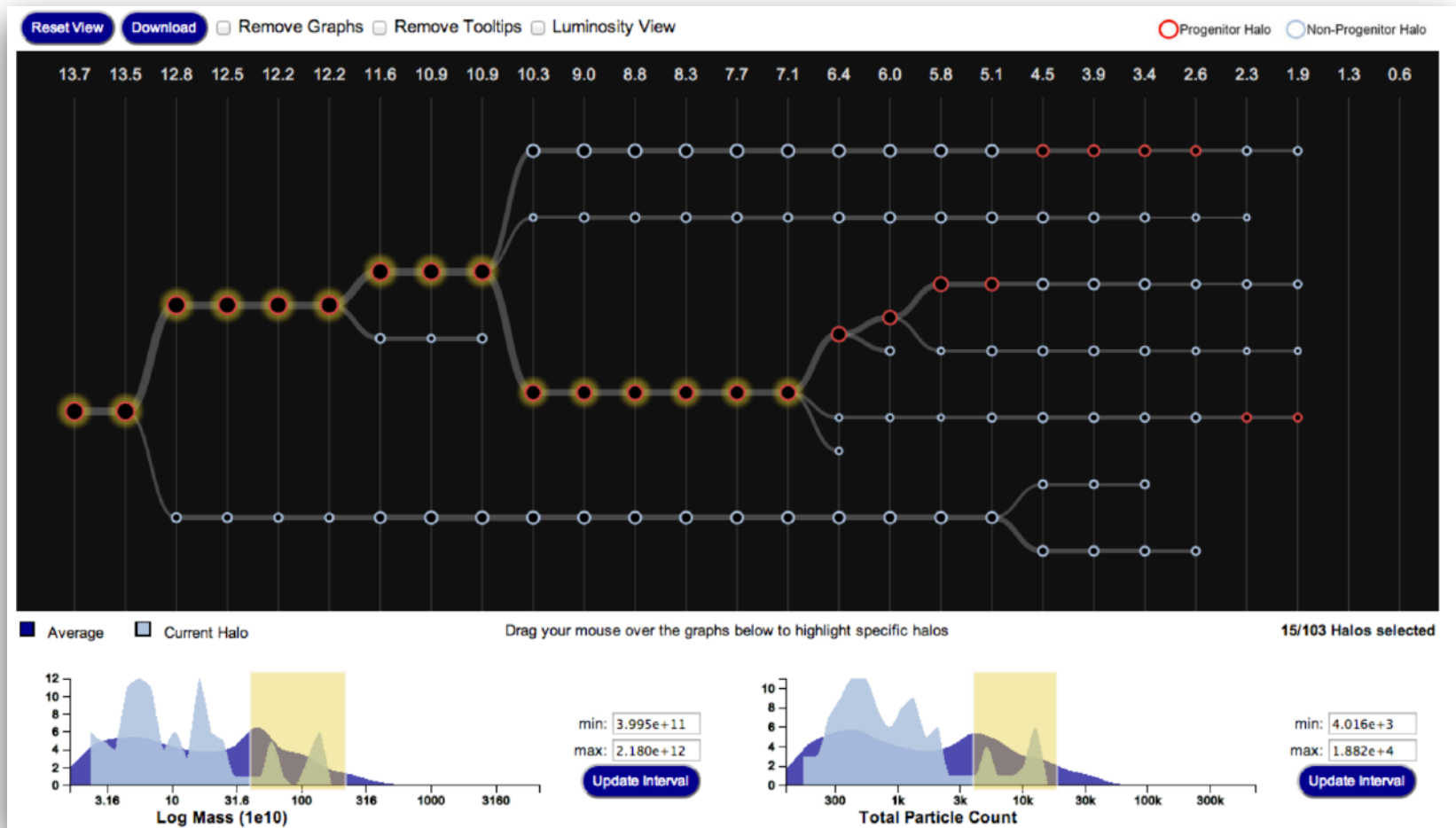
S. Loebman, **J. Ortiz**, **L. Orr**, M. Balazinska, T. Quinn et al. [SIGMOD '14]

Final Project Schedule

Proposal   Fri Nov 13
Milestone   Tue Dec 1
Demo Video   Wed Dec 9
Video Showcase Thur Dec 10 (in class)
Deliverables   Mon Dec 14

Logistics
Final project description posted online
Work in groups of up to 5 people
Start determining your project topic!

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!)

A3 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… / I Wish… / What If?

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?"*
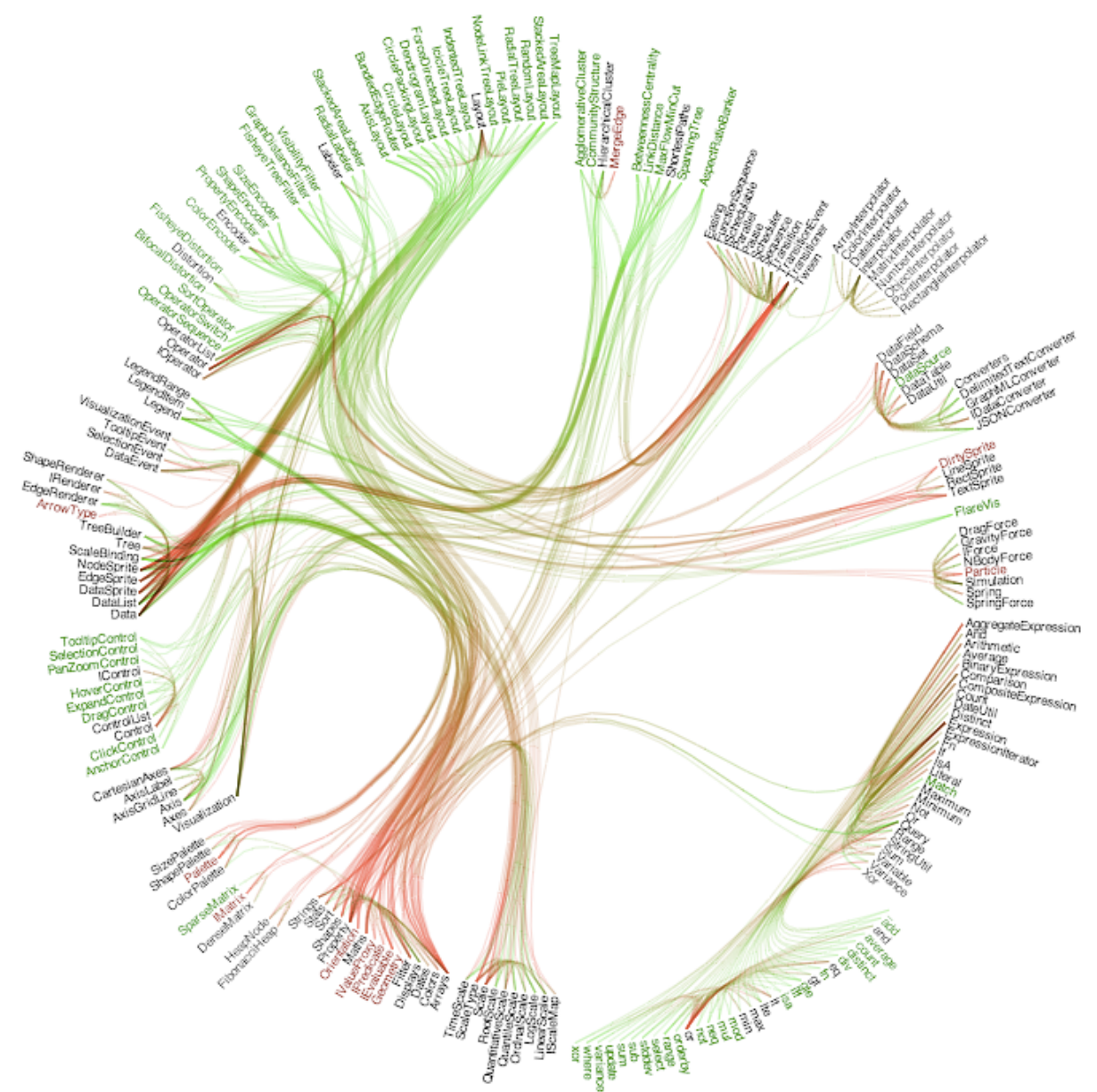
I Like… / I Wish… / What If?

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?

REVIEWER ☐ gpa ☐ academic_major ☐ age_range ☐ location ☑ gender ☐ signin_count ☑ user_id
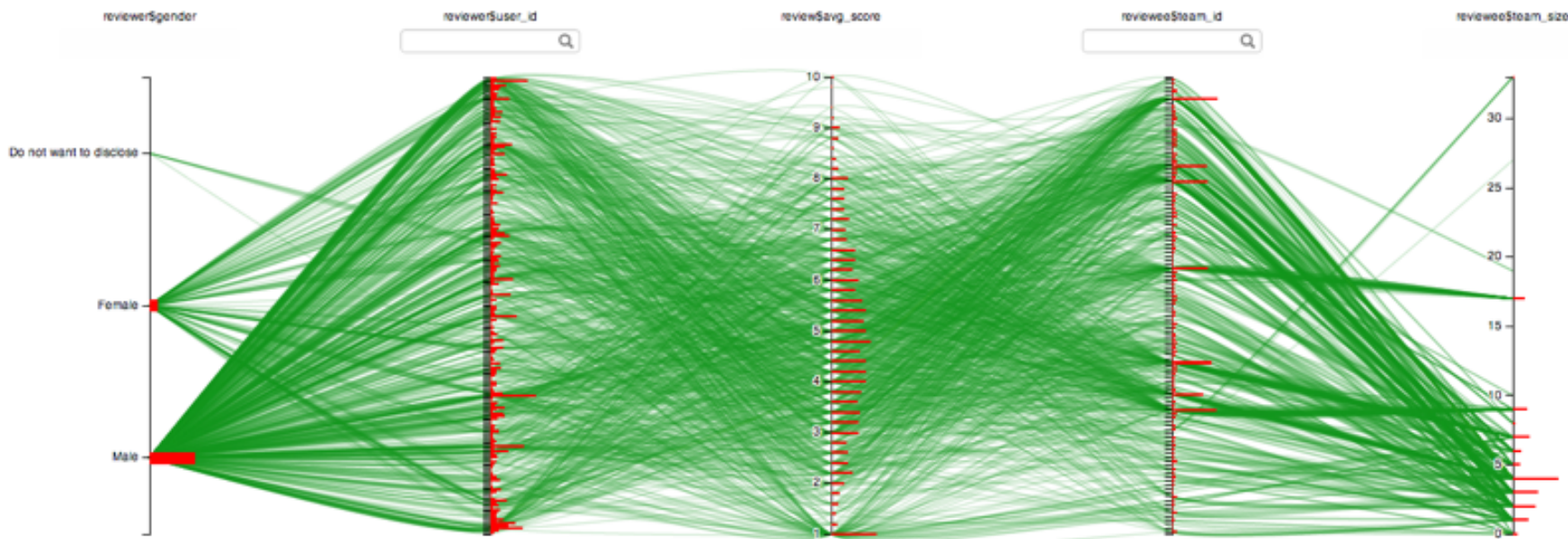REVIEW ☑ avg_score ☐ score1 ☐ score2 ☐ score3 ☐ score4 ☐ score5
REVIEWEE ☑ team_id ☑ team_size

reviewer$gender   reviewer$user_id   review$avg_score   reviewee$team_id   reviewee$team_size

Do not want to disclose

Female

Male

reviewer$gpa	reviewer$acad...	reviewer$age_...	reviewer$locat...	reviewer$gender	reviewer$signi...	reviewer$user_id	review$avg_s...	review$score1	review$score2	review$score3	review$score4	review$score5	reviewee$tea...	reviewee$tea...
NULL	NULL	NULL	NULL	NULL	21	37212	4	4	5	6	4	1	5069	4
NULL	NULL	NULL	NULL	NULL	21	37212	7.4	8	7	7	6	9	5470	17
Does not ...	Science	26-30	Netherlands	Male	124	2230	6.8	7	7	8	7	5	5693	7
Does not ...	Science	26-30	Netherlands	Male	124	2230	2.2	2	1	3	4	1	5836	4
Do not w...	Business	31-35	Spain	Male	80	2848	4.4	4	1	7	9	1	5069	4
3-3.49	Other	21-25	Spain	Female	75	2826	5	5	5	5	5	5	5215	4
3-3.49	Engineering	over 50	United St...	Male	110	19502	3.6	5	5	2	3	3	5215	4
3.5-4.00	Science	36-40	Greece	Male	125	27386	3.6	3	6	5	3	1	5250	3
3-3.49	Engineering	over 50	United St...	Male	110	19502	7	9	5	9	6	6	5693	7

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

A3 Prototype Peer Critiques

Review **three** A3 submissions (assigned on <u>Canvas</u>)

Submit **three** critique forms by **Mon 11/16, 11:59**

Follow **I like / I wish / What if?** format for critiques
Be positive! Be constructive! Share crazy ideas!

https://courses.cs.washington.edu/courses/cse442/20au/a3-peereval.html

https://observablehq.com/d/e7b5087226bc7aab
https://observablehq.com/@boynamedhsu/college-prices-throughout-the-years
https://cse442-20f.github.io/A3-COVID19-Highlighting-Inequality-in-America/
https://cse442-20f.github.io/A3-covid19-around-the-world/
https://cse442-20f.github.io/A3-CovidDaily/
https://observablehq.com/@albeed/cracking-the-summoners-rift
https://observablehq.com/d/e813b6f60a87a4b8
https://cse442-20f.github.io/A3-education-attainment/
https://cse442-20f.github.io/A3-Equitable-Access-to-Food/
https://observablehq.com/@ccjeane/a3
https://cse442-20f.github.io/A3-Hate-in-America/
https://cse442-20f.github.io/A3-Human-Trafficking/
https://observablehq.com/d/c6f5dbc19beb338f
https://cse442-20f.github.io/A3-Mental-Health-Pandemic/
https://cse442-20f.github.io/A3-Moving-Around-NYC/
https://cse442-20f.github.io/A3-Police_Stop_Data/
https://cse442-20f.github.io/A3-Population-Density-Explorer/
https://cse442-20f.github.io/A3-San-Fransisco-CrimeMap/
https://cse442-20f.github.io/A3-School-to-Prison-Pipeline-in-Washington/
https://cse442-20f.github.io/A3-Success-in-Music-Markets/
https://cse442-20f.github.io/A3-The-American-Fire-Problem/
https://cse442-20f.github.io/A3-USSuicideRates/
https://observablehq.com/d/1f9ee88e295e03e8
https://observablehq.com/@parkerterry/demographics-and-police-shootings
https://observablehq.com/d/46cfadc54e1507c6
https://cse442-20f.github.io/A3-WorldDevWatcher/
https://observablehq.com/@corelli/yelp-check-ins-over-time-for-different-categories-of-restau

Reminders!

Final Project Proposal Due **Fri 11/13, 11:59pm**
https://courses.cs.washington.edu/courses/cse442/20au/fp.html

Three Peer Evaluations Due **Mon 11/16, 11:59pm**
https://courses.cs.washington.edu/courses/cse442/20au/a3-peereval.html