

Project GHOST

The CDC's Global Hepatitis Outbreak &
Surveillance Technology

Lovissa Winyoto

Jeongsoo Kim

Raghav Kaul

Ernest Lai

Sarthak Mohapatra

Outline

- What is Hepatitis C?
- Overview of GHOST
- Summary of Feasibility Report
- Summary of Statement of Work
- Prototype Demo
- Summary
- Reflection

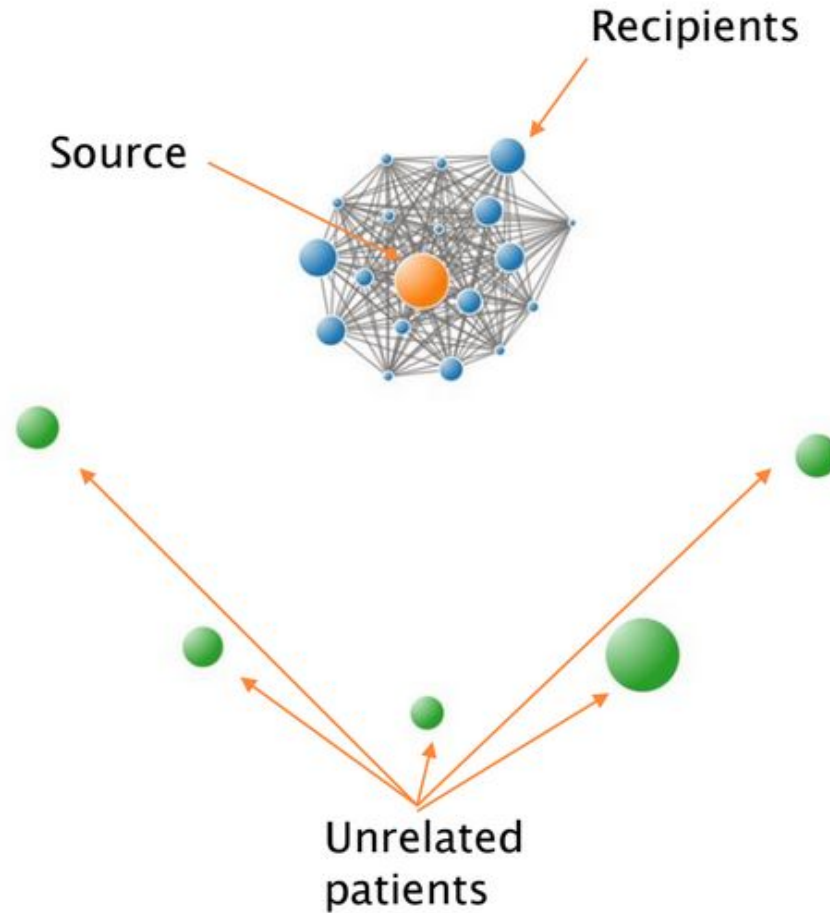
Motivation

3 FACTS ABOUT HEPATITIS C

- 1 Hepatitis C is a **LEADING CAUSE OF LIVER CANCER.**
- 2 Millions of Americans have hepatitis C, but **MOST DON'T KNOW IT.**
- 3 **TREATMENTS CAN ELIMINATE** the hepatitis C virus.



Motivation



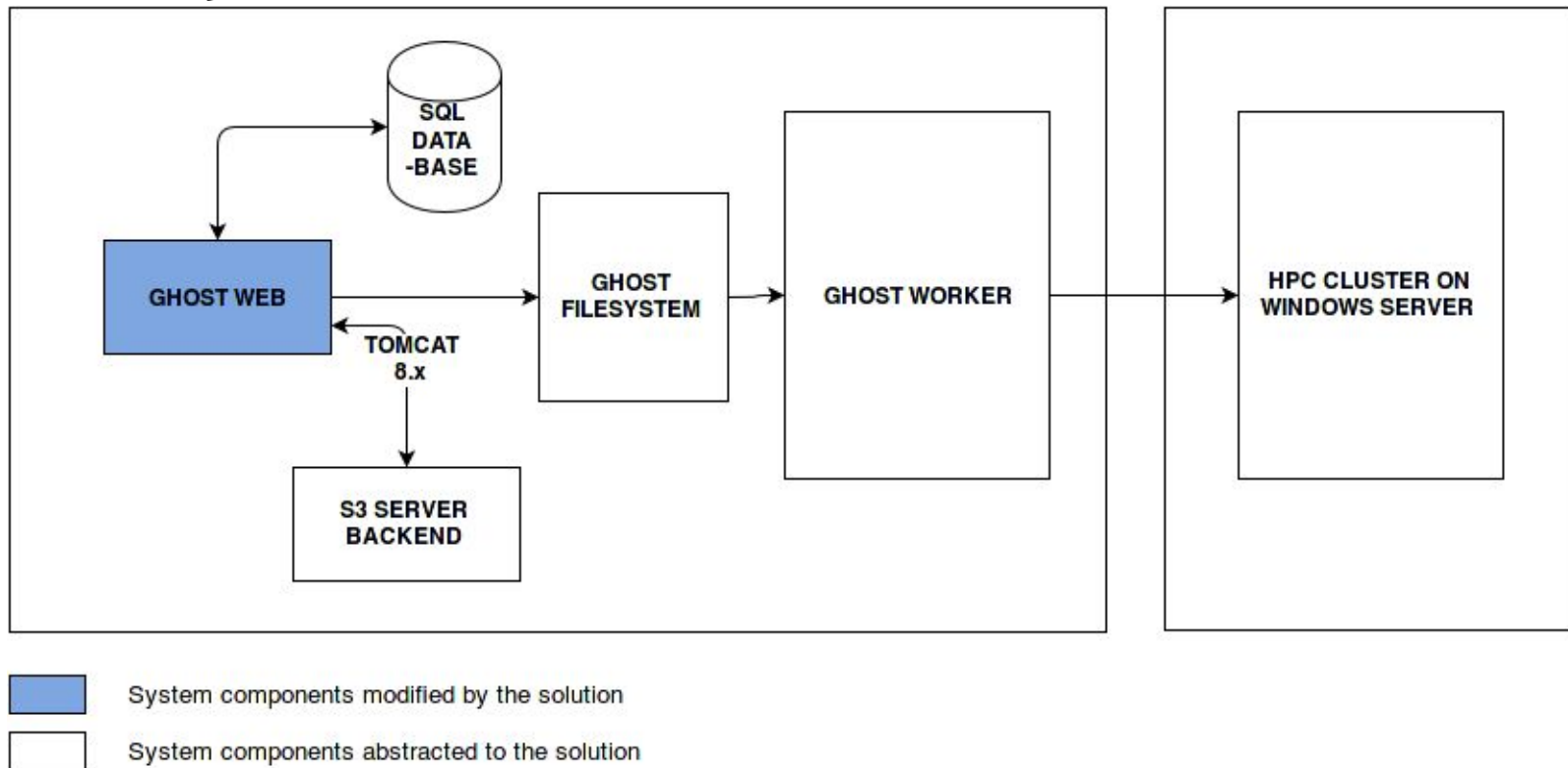
Current system (overview)



GHOST Global Hepatitis Outbreak Surveillance Technology



Current system (architecture)



Feasibility Report (Alternatives, criteria)

Alternatives

- D3 (JavaScript) vs Flare (Flash)

Criteria

- Rendering speed
- Budget
- Maintainability

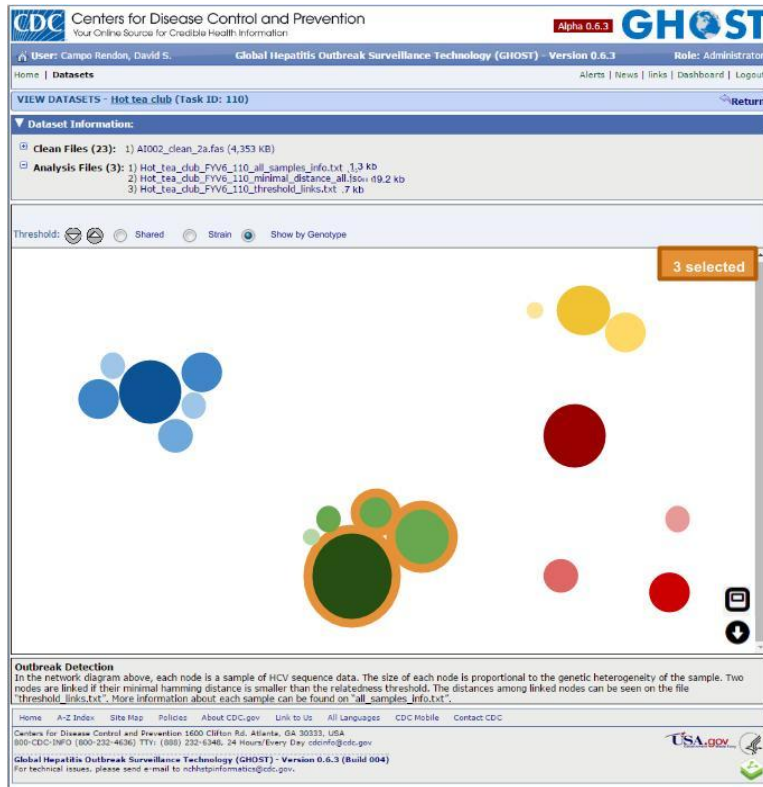
Feasibility Report (Results)

	D3.js (existing system)	Flare/Prefuse (new system)
Rendering speed	60 fps (n<10) to 10 fps (n>1000)	Fully controllable at runtime
Loading Speed	Loads up to 3 times faster than Flare	Loads slowly (have to load a plugin)
Works with JSON?	Yes	Yes
Free & Open Source?	Yes	Yes
Development Support	StackOverflow comments: ~16k for D3, ~1k for NVD3 (a D3 add-on), ~962k for Javascript	StackOverflow comments: ~30 for Flare & Prefuse, ~47k for Actionscript

Statement of Work: Solution (Node Visualization)

Data Visualization

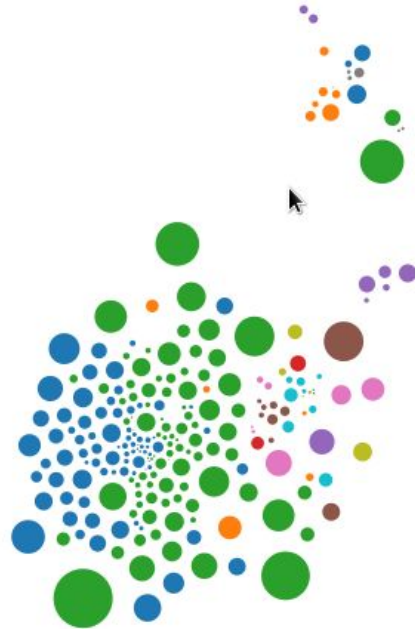
- Threshold bar
- Selection schema
- Toggle mode
- Download




Node Visualization


Show by ▾

Threshold: + -



Statement of Work: Solution (Landing page)


Centers for Disease Control and Prevention
 Your Online Source for Credible Health Information

Alpha 0.6.3


User: Campo Rendon, David S. **Global Hepatitis Outbreak Surveillance Technology (GHOST) - Version 0.6.3** **Role:** Administrator

[Home](#) [Alerts](#) | [News](#) | [links](#) | [Dashboard](#) | [Logout](#)

My Analysis
[New](#) | [Edit](#) | [Delete](#) | [Share](#)

Find: Search database...

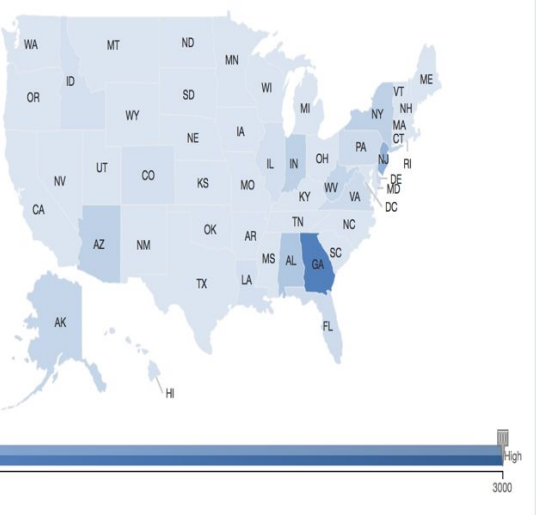
Rows per Page: 10 Page 1 of 5 Displaying 1 to 28 of 125 items

Task ID	Name	Description	Task Type	Country	State	Status	Date	Data Sets	Owner
132	WV vs NJ		Analysis	United States	MULTI	Complete	08/10/2015	CLEAN(7) ANALYSIS(3)	Figueroa, Juan
131	C15WV7	C15WV7	Quality Control	United States	WV	Complete	08/10/2015	RAW(1) CLEAN(1)	Figueroa, Juan
130	C15WV vs 4C15NJ	Analysis for concomitant occu	Analysis	United States	MULTI	Complete	08/10/2015	CLEAN(6) ANALYSIS(3)	Figueroa, Juan
129	Network analysis		Analysis	United States	NJ	Complete	08/10/2015	CLEAN(5) ANALYSIS(3)	Figueroa, Juan
128	C15WV	Outbreak in WV	Quality Control	United States	WV	Complete	08/10/2015	RAW(2) CLEAN(1)	Figueroa, Juan
127	C15NJ							AN(5)	Figueroa, Juan
126	Testa dataset							LYSIS(3)	Figueroa, Juan
125	Training							AN(24)	Figueroa, Juan
124	TEST2							LYSIS(3)	Carneiro, Bruno
123	Analysis test							AN(24)	Carneiro, Bruno
122	TEST1							AN(16)	Dimitrova, Zoya
121	a test							AN(16)	Sue, Amanda
120	hcv outbreak batch 44 india							YSIS(3)	Campo Rendon, David
118	outbreak:1 from korea							AN(6)	Campo Rendon, David
117	samples Dr. Lee Korea							AN(16)	Campo Rendon, David
116	sync2 clean							AN(24)	Campo Rendon, David
115	sync clean							AN(24)	Campo Rendon, David
114	sync analysis							LYSIS(3)	Campo Rendon, David
113	sync 1							AN(16)	Campo Rendon, David
112	f		Analysis			Complete	08/25/2015	CLEAN(3) ANALYSIS(3)	Campo Rendon, David
111	hot tea		Quality Control	United States	AZ	Complete	06/25/2015	RAW(16) CLEAN(16)	Campo Rendon, David
110	Hot tea club		Analysis			Complete	06/24/2015	CLEAN(24) ANALYSIS(3)	Campo Rendon, David
109	Hot tea club	24 samples, two genotypes, tv	Quality Control	United States	GA	Complete	08/24/2015	RAW(24) CLEAN(24)	Campo Rendon, David
107	Hot tea club, network		Analysis			Complete	06/24/2015	CLEAN(25) ANALYSIS(3)	Campo Rendon, David
106	Hot tea club	Two genotypes, three clusters	Quality Control	United States	GA	Complete	06/24/2015	RAW(25) CLEAN(25)	Campo Rendon, David
105	Hot tea club	test	Quality Control	Colombia		Complete	06/24/2015	RAW(25) CLEAN(25)	Campo Rendon, David
103	Hot tea club		Quality Control	United States	CO	Complete	06/24/2015	RAW(25) CLEAN(25)	Campo Rendon, David
101	Hot tea club final	25 samples, two genotypes, tv	Quality Control	United States	GA	Complete	06/24/2015	RAW(25) CLEAN(25)	Campo Rendon, David

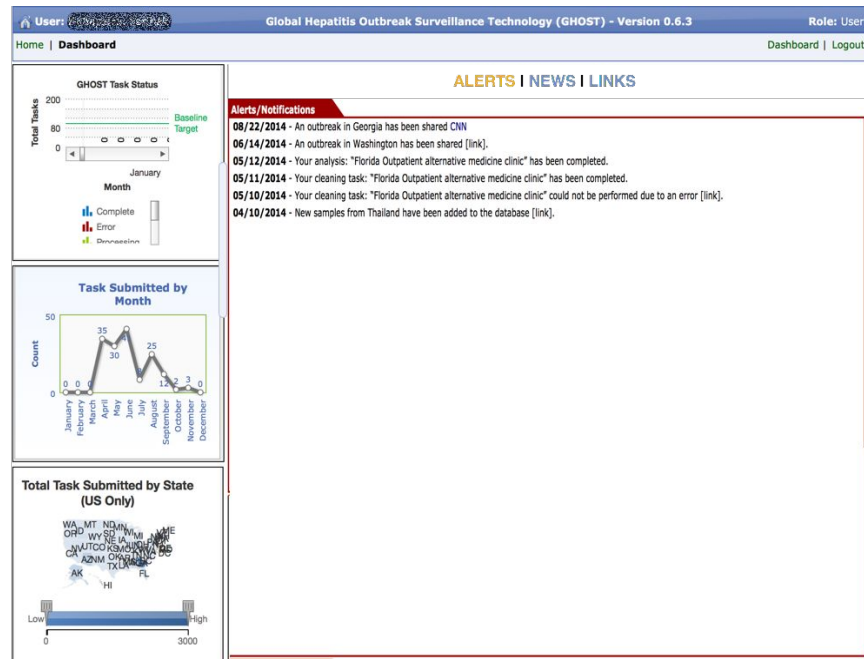
Welcome to GHOST
 (Global Hepatitis Outbreak and Surveillance Technology)

[Link to Text Walkthrough](#)
[Link to Video Walkthrough](#)

Continue



Work: Solution (Dashboard)



Statement of Work: Schedule

Releases

- Node-link visualization
- Landing page
- Dashboard
- Testing and documentation

Summary

- GHOST is a system provided by the CDC for detections of Hepatitis C outbreaks
- D3.js is the selected framework for its' rendering speed and ease of maintainability
- Landing page, visualizations, and dashboard components will be modified

Reflection

Learned

- Formal documentation
- Client communication

Improvement For next semester

Reflection

Learned Improvement

- Earlier Prototyping
- Aligned Expectations

For next semester

Reflection

Learned Improvement For next semester

- Scheduling resolutions
- Client communication



Questions?

