Hands-on with Warcbase

The Workshop

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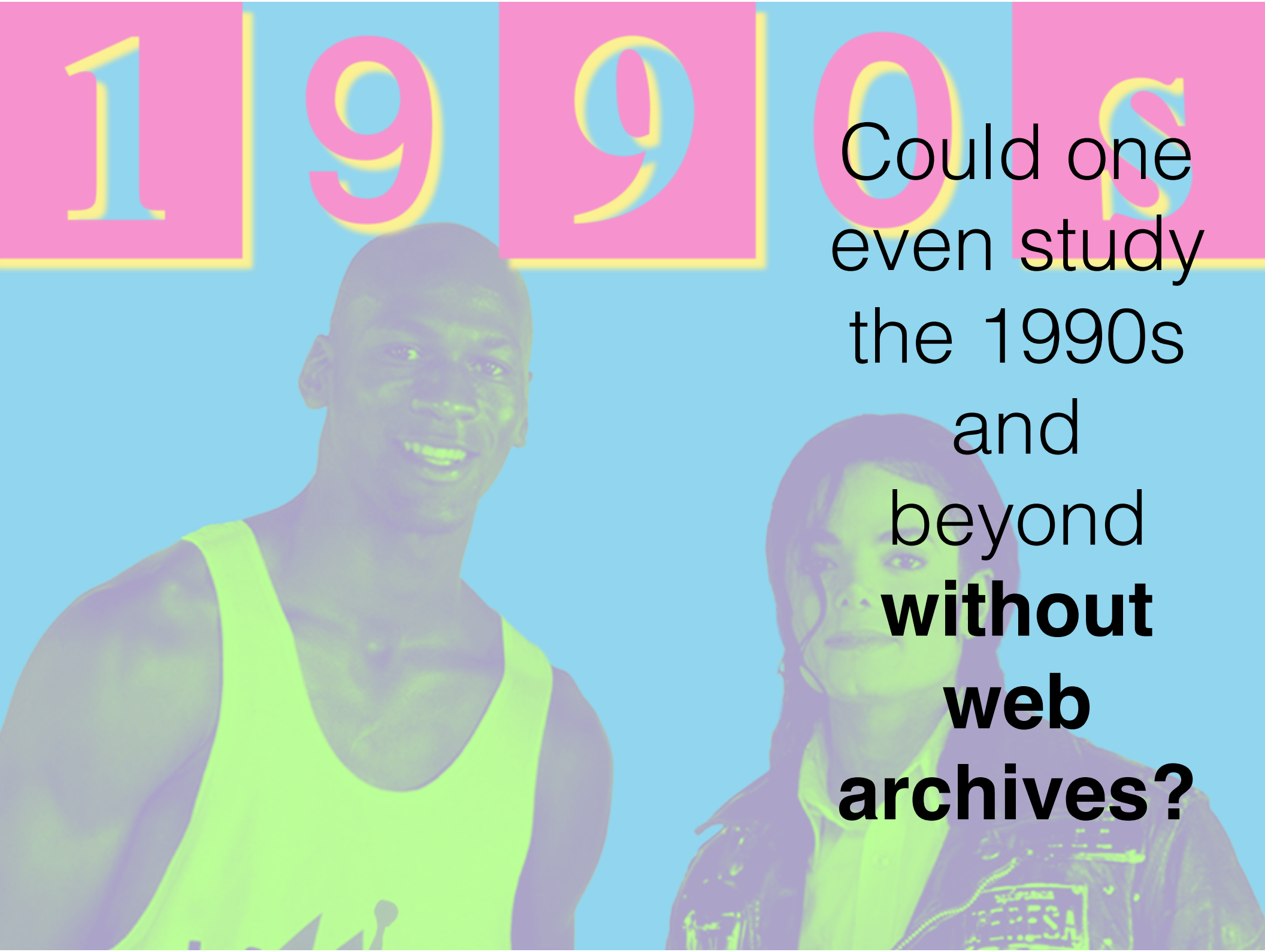
The Web as a Primary Source

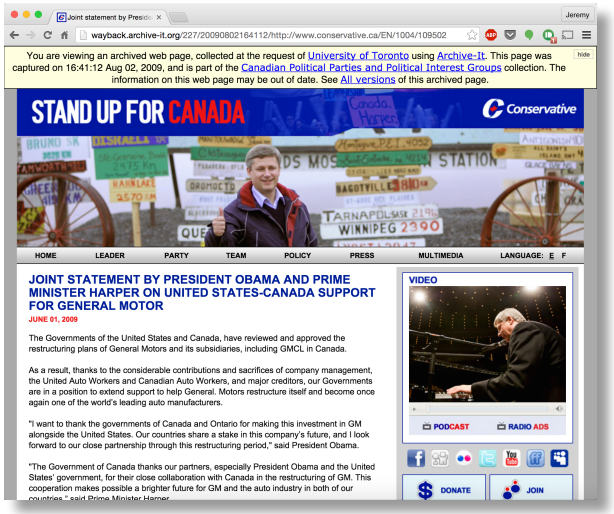
- **Web archives will fundamentally affect the way historians write history**
  - We will have easier access to information on a previously-unknown scale, as well as improved capability to parse it;
  - Yet historians need to reflect on the shape that Web-based primary sources will take, and **how we will be able to access them**


1990s
Could one even study the 1990s and beyond **without web archives?**

Warcbase

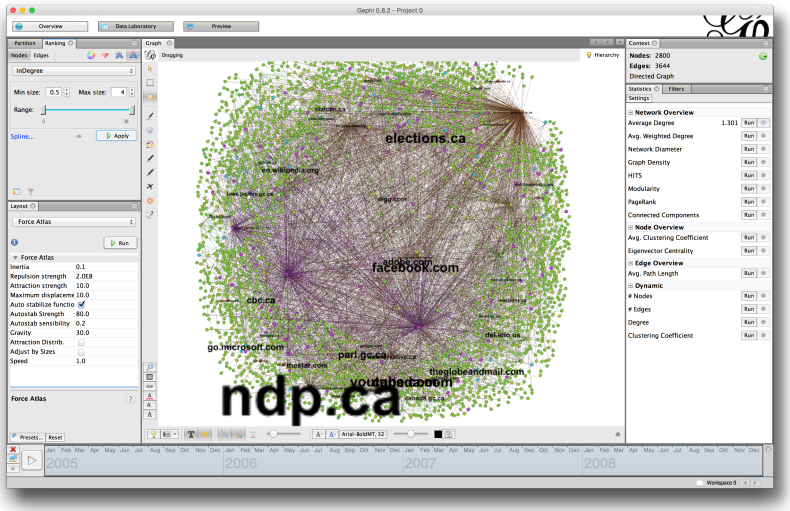
An open-source platform for managing web archives

http://warcbase.org

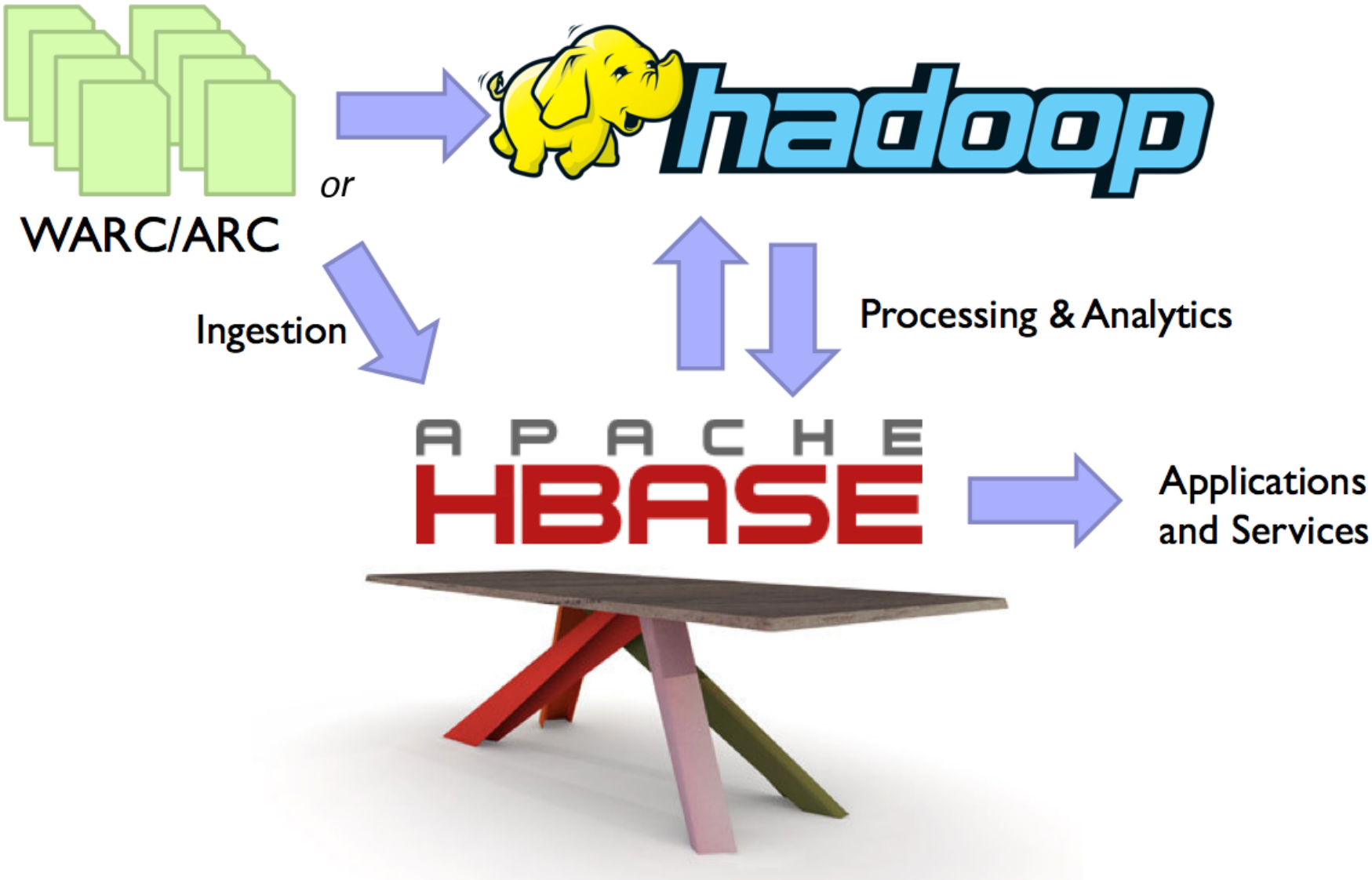


Two main facets

- A flexible data store: your own Wayback Machine
- Scriptable analytics and data processing



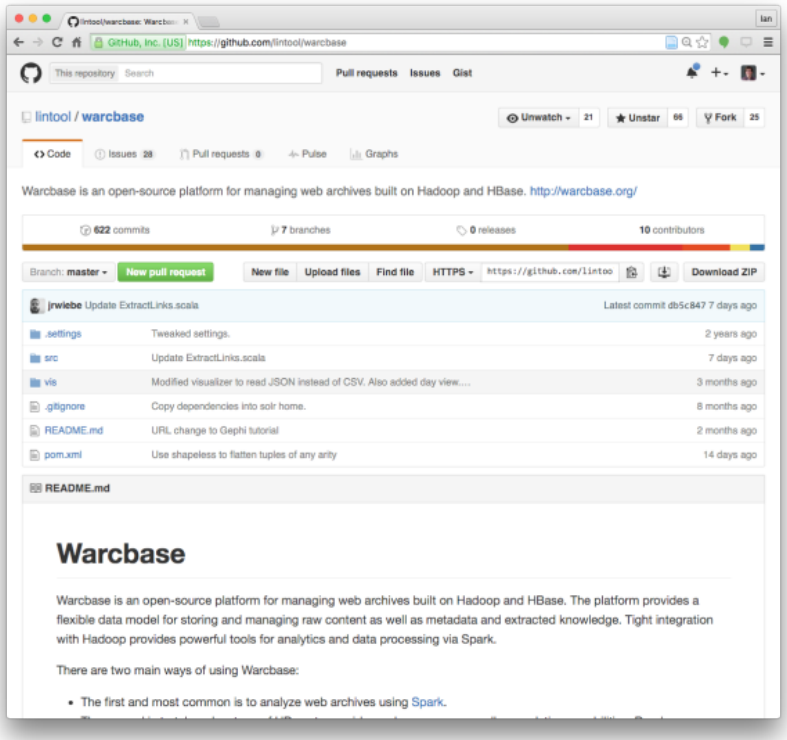
Warcbase

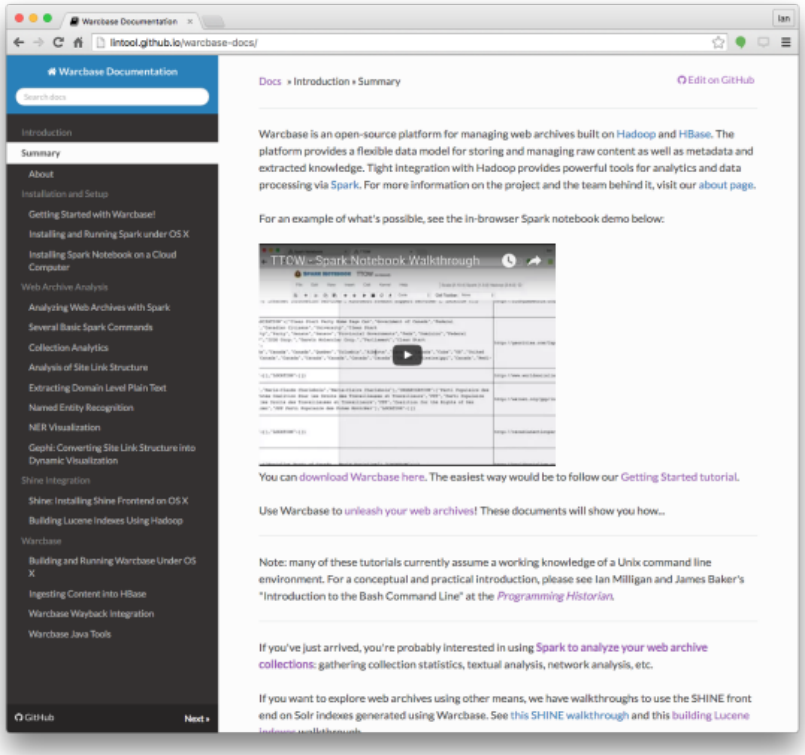

WARC/ARC
or
hadoop
Ingestion
Processing & Analytics
APACHE
HBASE
Applications
and Services

Warcbase

- Framework for distributed storage and distributed processing of very big data
- Scalable
  - From Raspberry Pi to Desktop Computer to Server to Cluster, **all with the same scripts & commands**
- **Potentially very powerful**
  - *Trantor*: 1.2PB of disk, 25 compute nodes (each w/ 128GB memory, 2×6-core Intel Xeon E5 v3 = 3.2TB memory and 300 current-generation Intel cores)

You can Warcbase Too (and will here!)

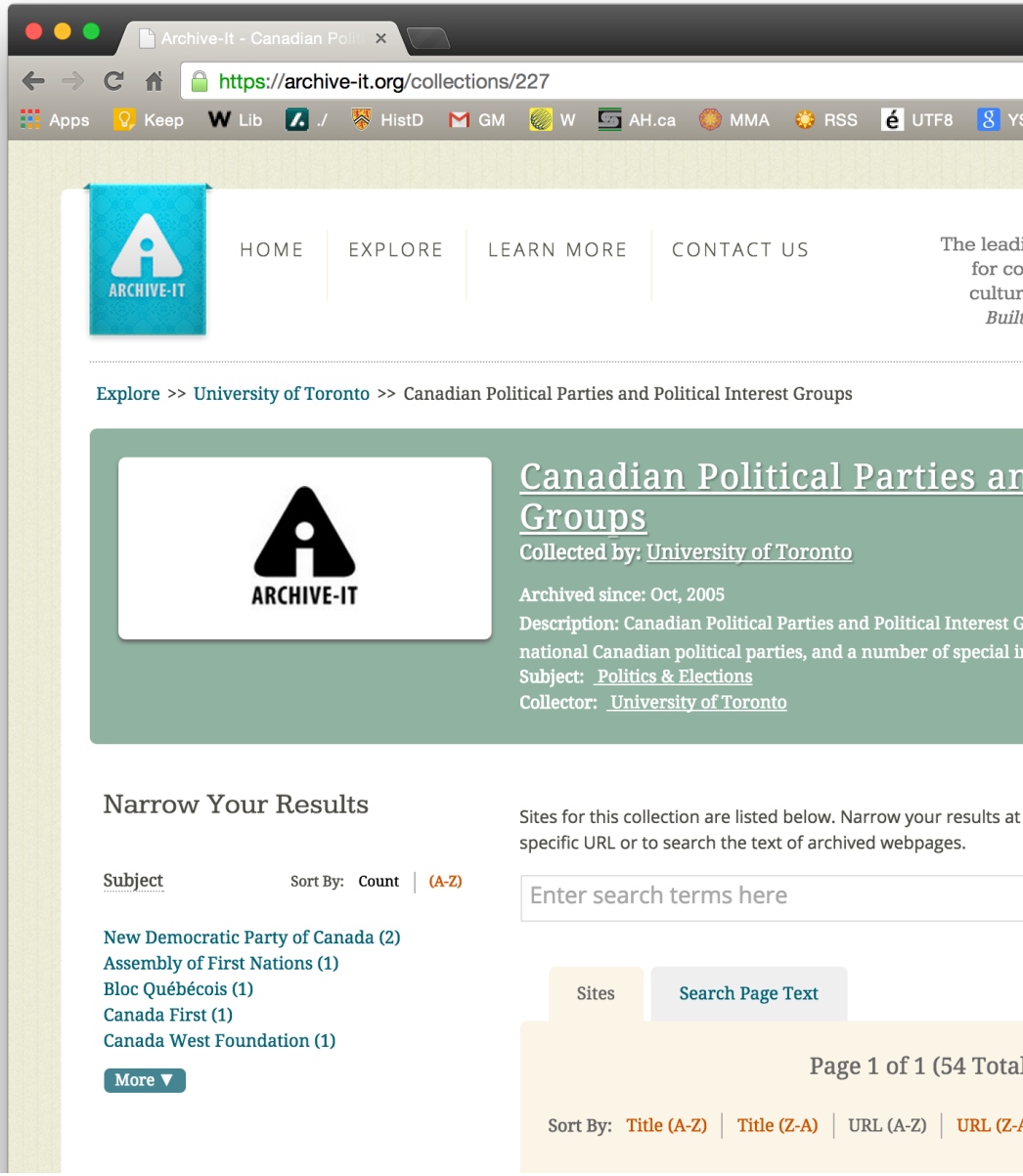




warcbase.org **docs.warcbase.org**

Two Case Studies

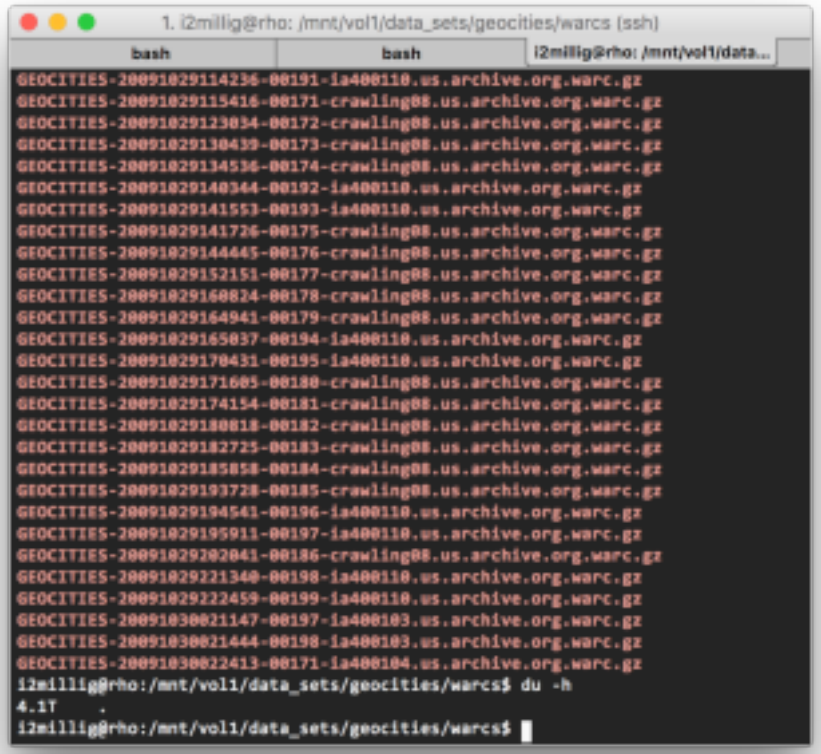
- **Archive-It Research Services**: "Canadian Political Parties and Political Interest Groups"
- 2005 - 2015
- WARC files



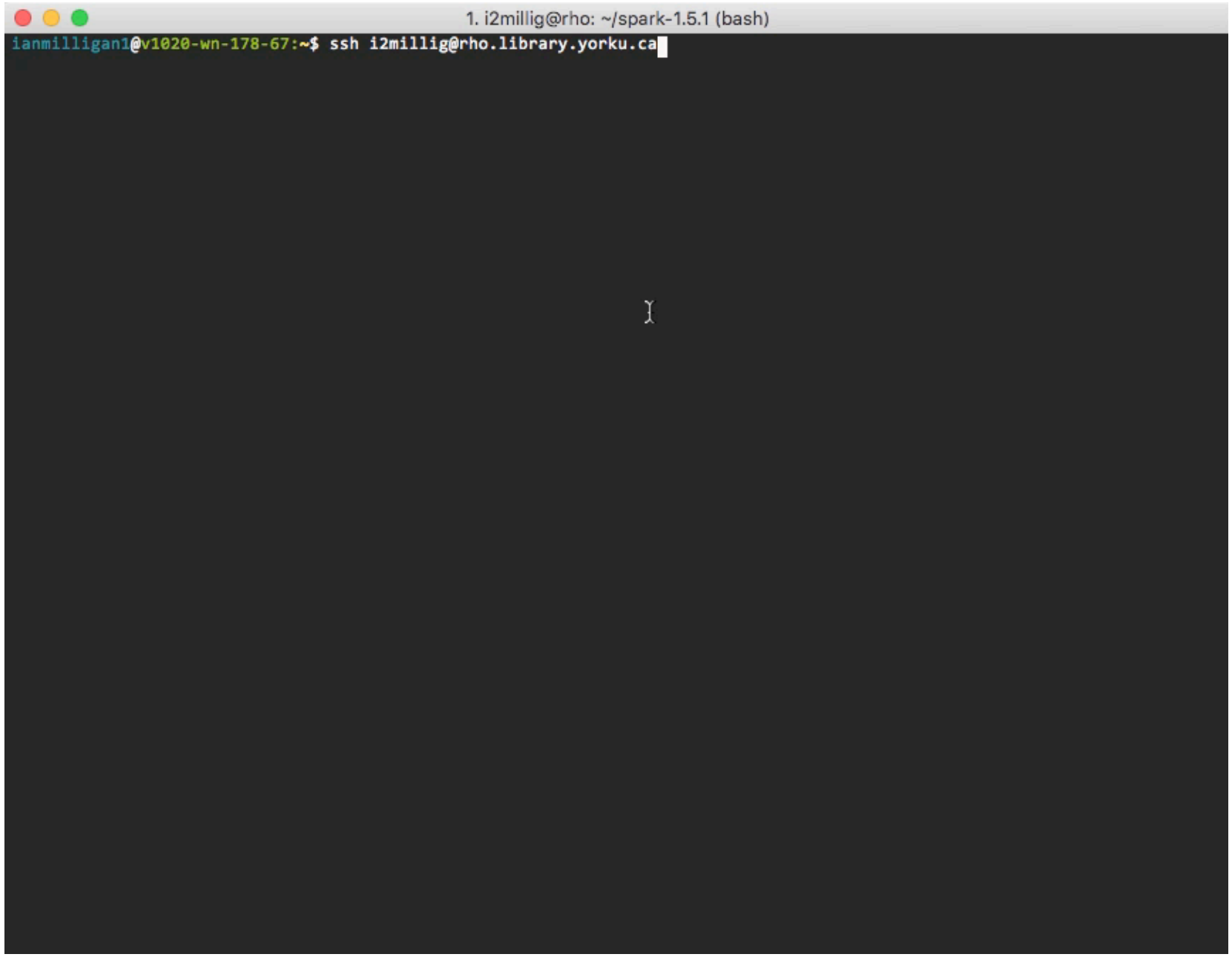
Two Case Studies

- **GeoCities**
- End-of-life crawl from 2009
- WARC files
- 4.1 TB, 186 million HTML documents

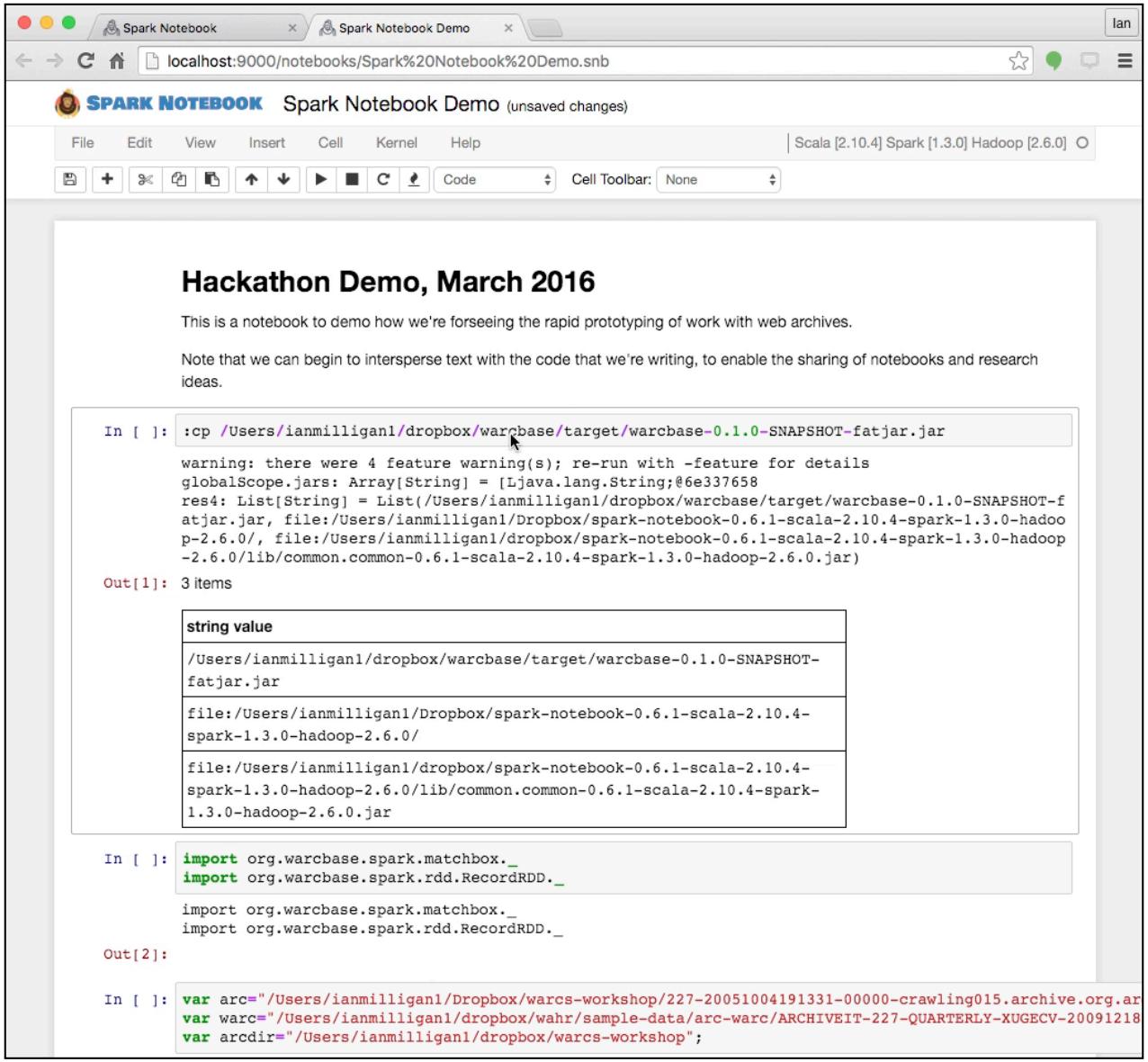
Step One: Grabbing WARCs



Step Two: Basic Shell Analysis



Step Two: Basic Analytics



Step Three: Filtering a Corpus

```
1  import org.warcbase.spark.matchbox.{ExtractTopLevelDomain,
       ExtractLinks, RecordLoader}
2  import org.warcbase.spark.rdd.RecordRDD._
3
4  RecordLoader.loadArc("/mnt/vol1/data_sets/geocities/warcs/*", sc)
5  .keepValidPages()
6  .map(r => (r.getCrawldate, ExtractLinks(r.getUrl, r.
       getContentString)))
7  .flatMap(r => r._2.map(f => (r._1, ExtractTopLevelDomain(f._1).
       replaceAll("^\\s*www\\.", ""), ExtractTopLevelDomain(f._2).
       replaceAll("^\\s*www\\.", ""))))
8  .filter(r => r._2 != "" && r._3 != "")
9  .countItems()
10 .filter(r => r._2 > 5)
11 .saveAsTextFile("/mnt/vol1/data_sets/geocities/geocities.
       sitelinks")
```

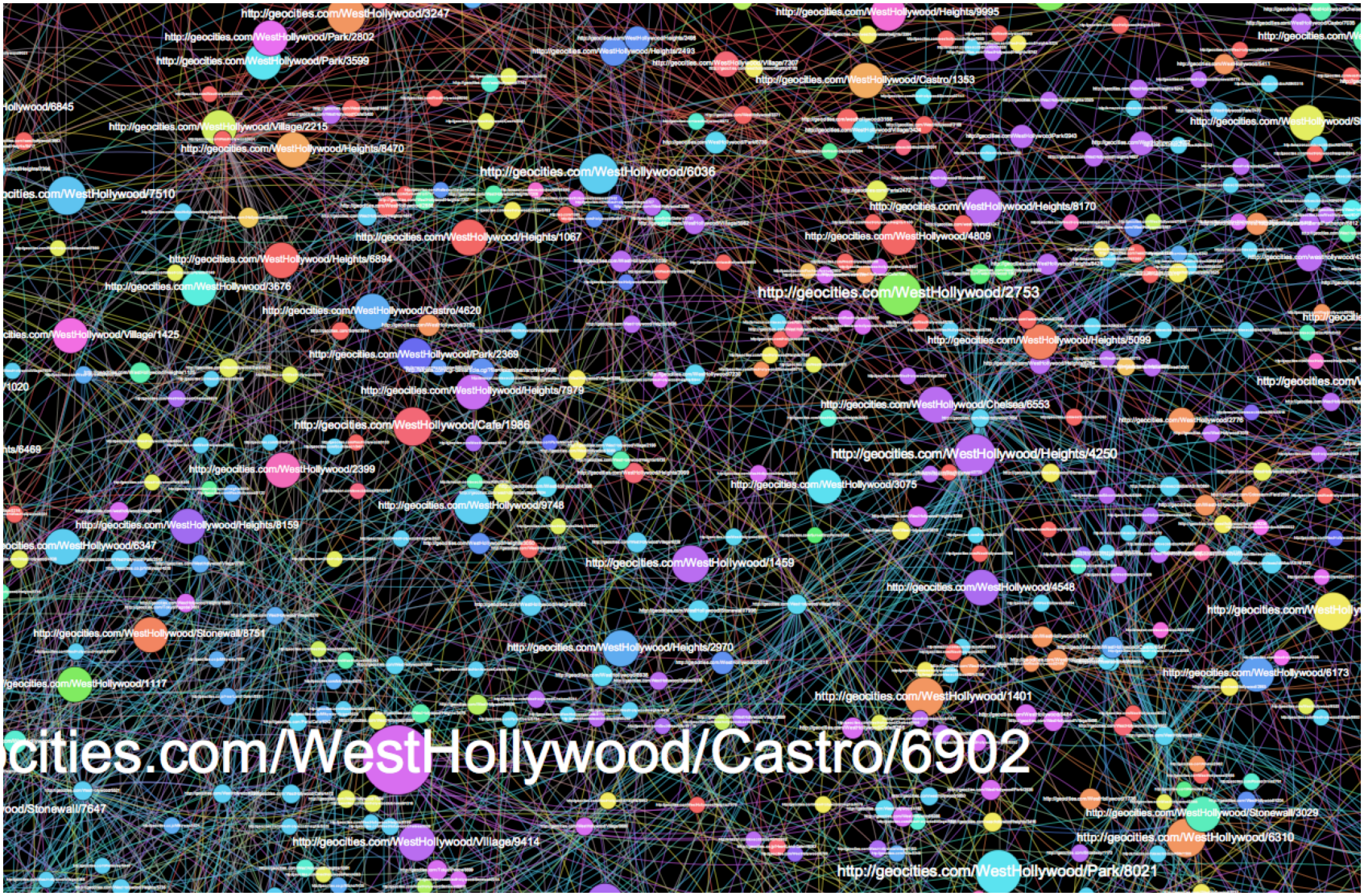
A Link Graph

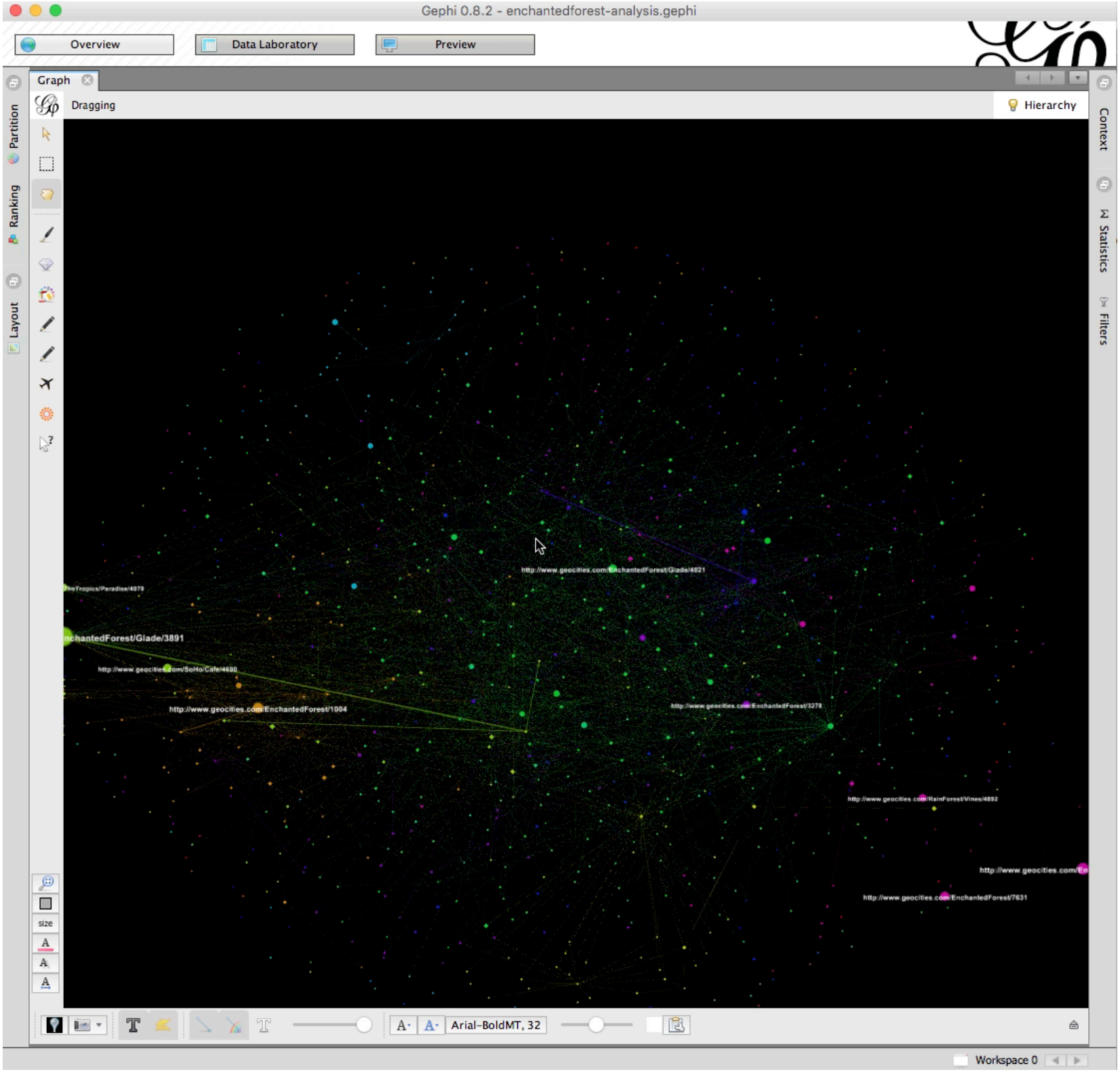
Step Three: Filtering a Corpus

```
1 ((20090903,http://geocities.com/saganaki2000/ADSLGR/adslgr.htm,
  http://www.adslgr.com),15337)
2 ((20091026,http://geocities.com/saganaki2000/ADSLGR/adslgr.htm,
  http://www.adslgr.com),15337)
3 ((20091027,http://geocities.com/spankbank69hard/,http://pg.photos
  .yahoo.com/ph/spankbank69hard/my_photos/),9807)
4 ((20090903,http://geocities.com/spankbank69hard/index.html,http:/
  /pg.photos.yahoo.com/ph/spankbank69hard/my_photos/),9807)
5 ((20091027,http://geocities.com/CollegePark/Locker/8187/,http://
  www.comercialuruapan.com),8056)
6 ((20090903,http://geocities.com/CollegePark/Locker/8187/,http://
  www.comercialuruapan.com),8056)
```

Results

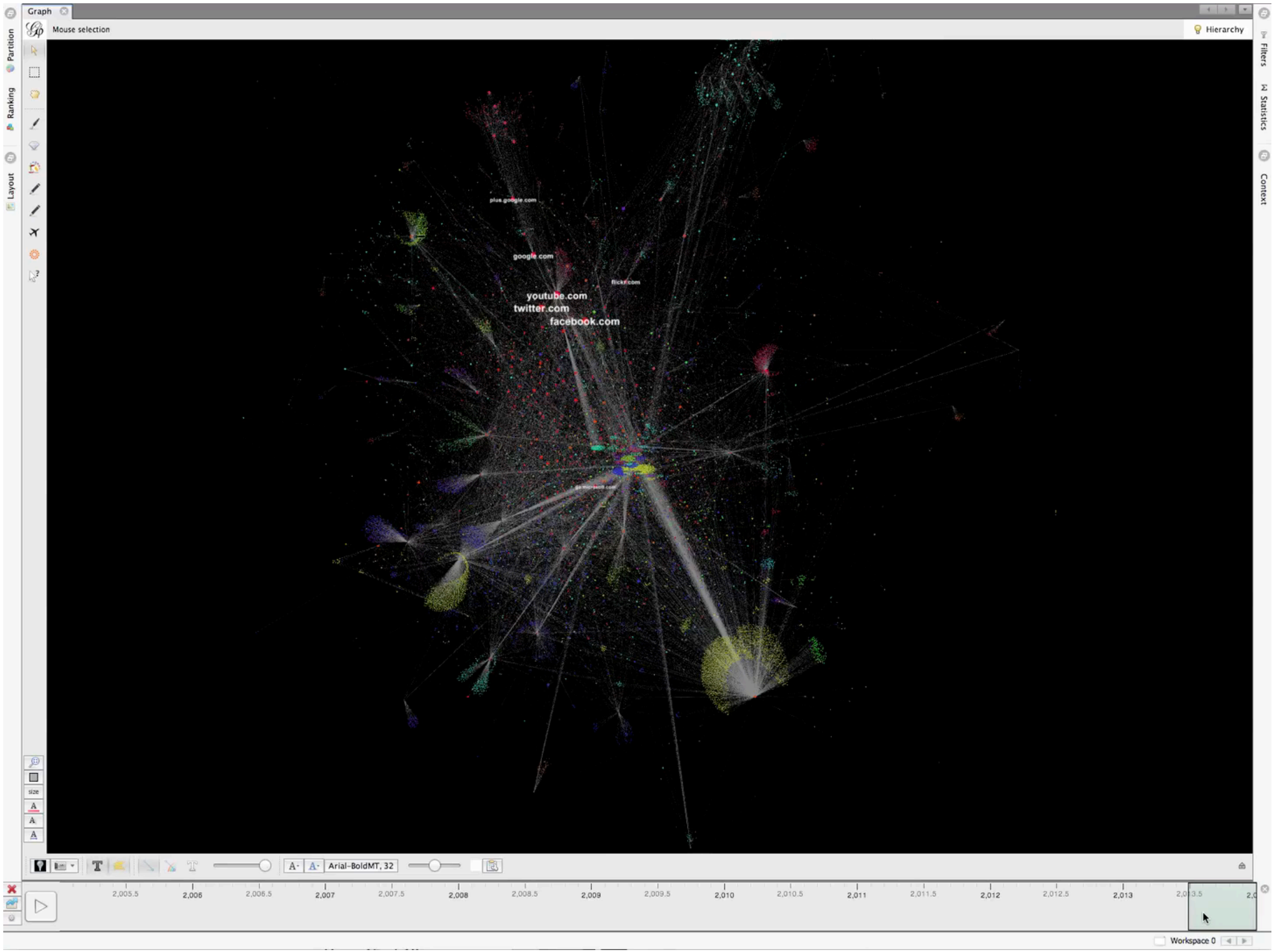
Filtering


http://geocities.com/WestHollywood/3247
http://geocities.com/WestHollywood/Park/2802
http://geocities.com/WestHollywood/Park/3599
http://geocities.com/WestHollywood/Heights/9995
http://geocities.com/WestHollywood/Heights/2493
http://geocities.com/WestHollywood/Village/7307
http://geocities.com/WestHollywood/Castro/1353
http://geocities.com/WestHollywood/Village/2215
http://geocities.com/WestHollywood/Heights/8470
http://geocities.com/WestHollywood/6036
http://geocities.com/WestHollywood/Heights/8170
http://geocities.com/WestHollywood/Heights/1067
http://geocities.com/WestHollywood/4809
http://geocities.com/WestHollywood/Heights/6894
http://geocities.com/WestHollywood/3676
http://geocities.com/WestHollywood/2753
http://geocities.com/WestHollywood/Castro/4620
http://geocities.com/WestHollywood/Heights/5099
http://geocities.com/WestHollywood/Park/2369
http://geocities.com/WestHollywood/Heights/7979
http://geocities.com/WestHollywood/Chelsea/6553
http://geocities.com/WestHollywood/Cafe/1986
http://geocities.com/WestHollywood/Heights/4250
http://geocities.com/WestHollywood/2399
http://geocities.com/WestHollywood/3075
http://geocities.com/WestHollywood/9748
http://geocities.com/WestHollywood/Heights/8159
http://geocities.com/WestHollywood/1459
http://geocities.com/WestHollywood/4548
http://geocities.com/WestHollywood/Stonewall/8751
http://geocities.com/WestHollywood/Heights/2970
http://geocities.com/WestHollywood/6173
http://geocities.com/WestHollywood/1401
cities.com/WestHollywood/Castro/6902
http://geocities.com/WestHollywood/Stonewall/3029
http://geocities.com/WestHollywood/6310
http://geocities.com/WestHollywood/Village/9414
http://geocities.com/WestHollywood/Park/8021

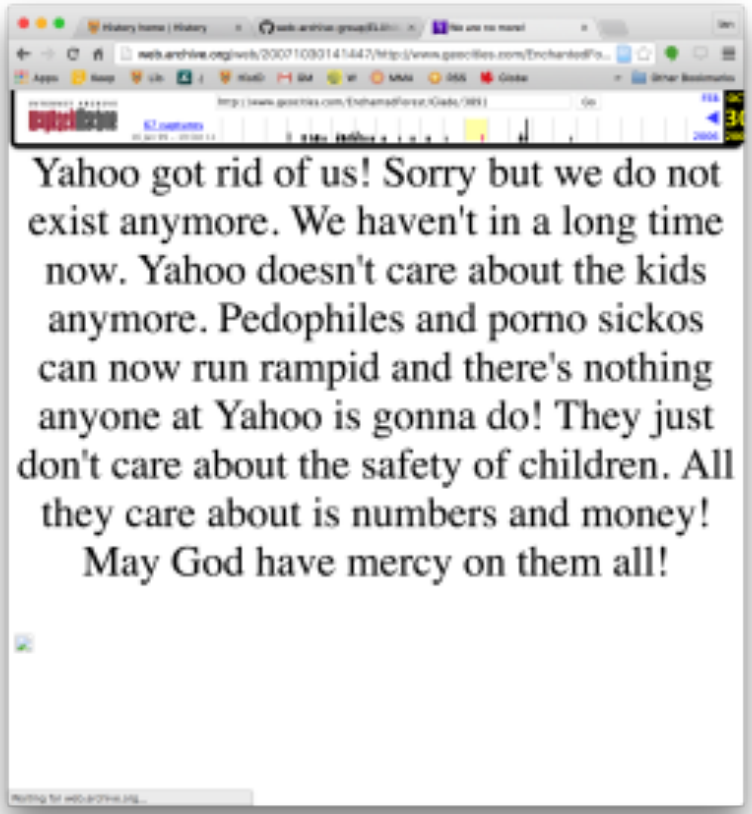

Gephi 0.8.2 - enchantedforest-analysis.gephi
Overview
Data Laboratory
Preview
Graph
Dragging
Hierarchy
Partition
Ranking
Layout
Context
Statistics
Filters
http://www.geocities.com/EnchantedForest/Glade/4021
nchantedForest/Glade/3891
http://www.geocities.com/SoHo/Cafe/4690
http://www.geocities.com/EnchantedForest/1004
http://www.geocities.com/EnchantedForest/3278
http://www.geocities.com/RainForest/Vines/4832
http://www.geocities.com/EnchantedForest/7631
size
Arial-BoldMT, 32
Workspace 0

Finding cool sites!

Label	PageRank	In-Degree	Out-Degree	Degree
http://www.geocities.com/EnchantedForest/Glade/3891	0.008	145	1	146
http://www.geocities.com/EnchantedForest/Glade/9378	0.005	6	13	19
http://www.geocities.com/EnchantedForest/1004	0.005	63	26	89
http://www.geocities.com/EnchantedForest/7631	0.004	6	3	9
http://www.geocities.com/SoHo/Cafe/4690	0.004	241	0	241
http://www.geocities.com/EnchantedForest/Glade/4021	0.004	151	0	151
http://www.geocities.com/TheTropics/Paradise/4079	0.003	248	0	248
http://www.geocities.com/RainForest/Vines/4892	0.003	5	6	11
http://www.geocities.com/EnchantedForest/3278	0.003	106	0	106
http://www.geocities.com/EnchantedForest/3696	0.003	70	0	70
http://www.geocities.com/EnchantedForest/Dell/5914	0.003	180	1	181
http://www.geocities.com/EnchantedForest/1469	0.003	16	49	65
http://www.geocities.com/EnchantedForest/Tower/9644	0.003	19	42	61
http://www.geocities.com/EnchantedForest/Dell/9501	0.003	79	362	441
http://www.geocities.com/EnchantedForest/Glade/8851	0.003	17	0	17
http://www.geocities.com/Heartland/Meadows/6263	0.003	9	0	9
http://www.geocities.com/Heartland/6188	0.003	56	0	56
http://www.geocities.com/EnchantedForest/4213	0.003	158	0	158
http://www.geocities.com/Athens/Acropolis/1465	0.003	20	0	20
http://www.geocities.com/EnchantedForest/8012	0.003	42	197	239
http://www.geocities.com/EnchantedForest/3810	0.003	98	147	245
http://www.geocities.com/EnchantedForest/Glade/3899	0.002	14	11	25
http://www.geocities.com/EnchantedForest/3015	0.002	64	0	64
http://www.geocities.com/EnchantedForest/Tower/8143	0.002	50	40	90
http://www.geocities.com/EnchantedForest/Meadow/1426	0.002	41	185	226


Graph
Mouse selection
Hierarchy
Partition
Ranking
Layout
Filters
Statistics
Context
plus.google.com
google.com
flickr.com
youtube.com
twitter.com
facebook.com
Arial-BoldMT, 32
2,005.5
2,006
2,006.5
2,007
2,007.5
2,008
2,008.5
2,009
2,009.5
2,010
2,010.5
2,011
2,011.5
2,012
2,012.5
2,013
Workspace 0

Step Four: Finding Significant Sites w/ PageRank



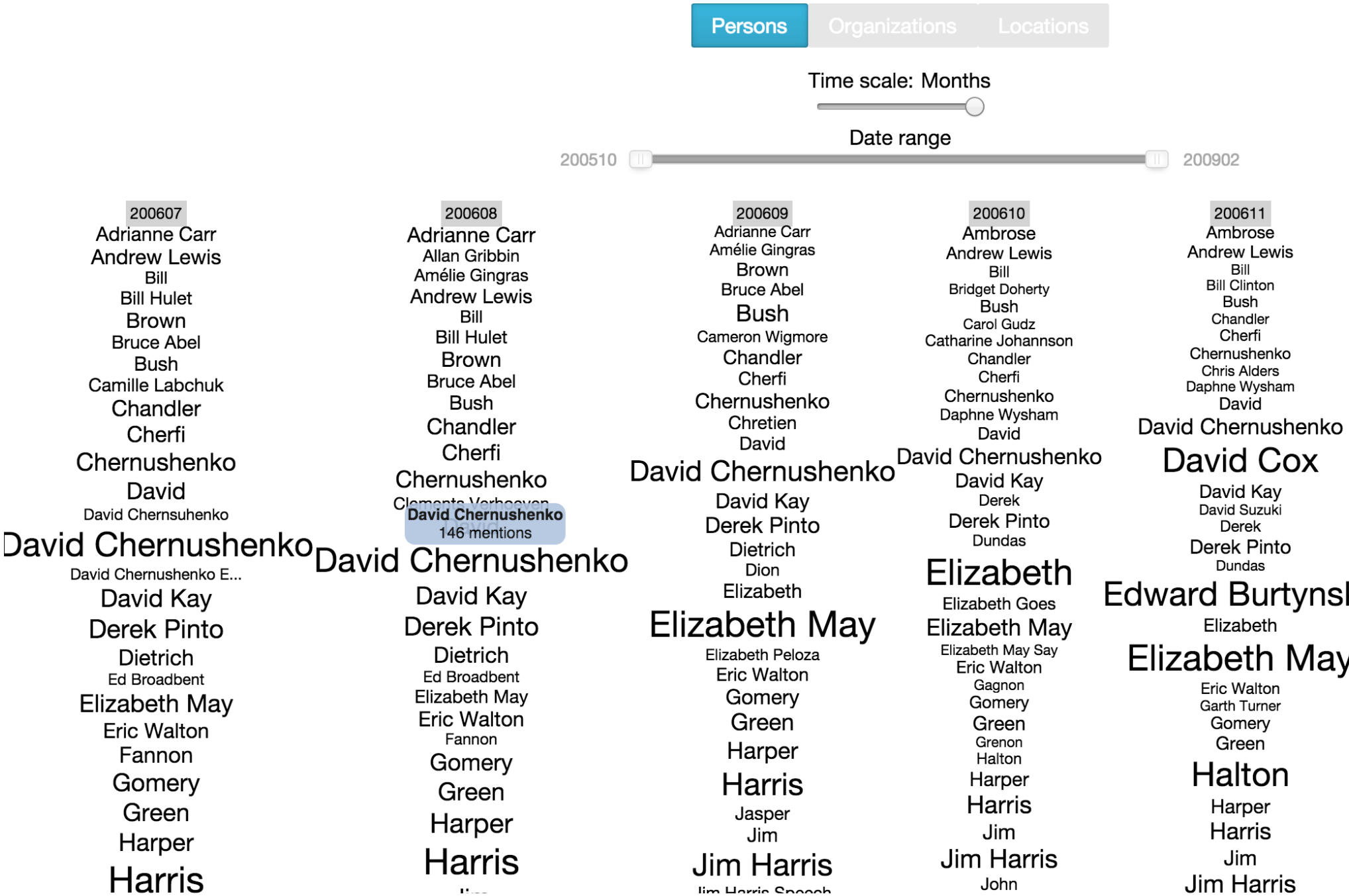
Step Five: Text Analysis

Different Ways to Filter

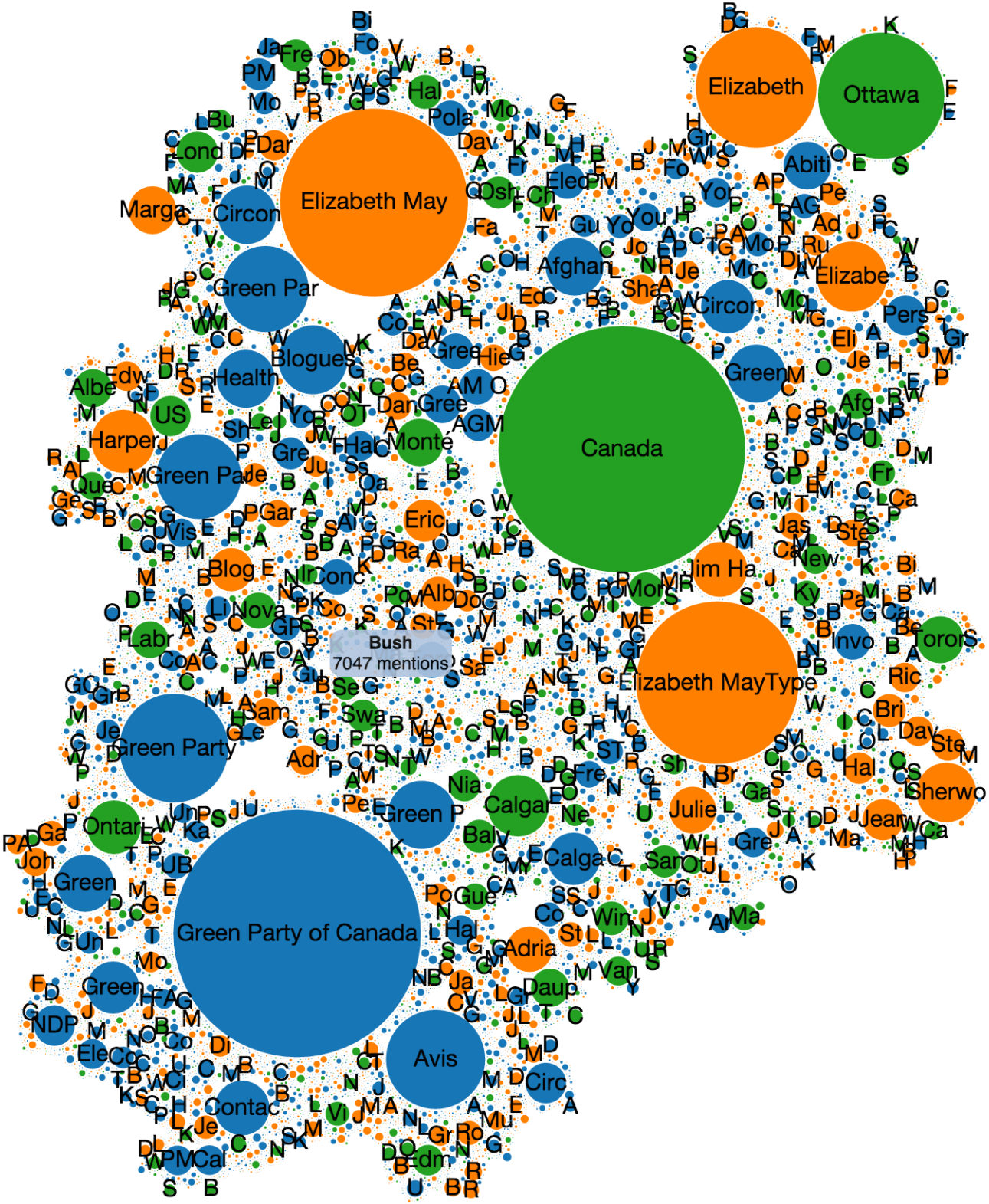
- Get everything
- Filter by domain (i.e. all pages in "greenparty.ca")
- Filter by URL pattern (i.e. all pages in "greenparty.ca/vegetables/*")
- Filter out boilerplate (i.e. advertisements, navigational elements, templates, etc.)
- Filter by date (i.e. all pages on July 4th, 2015)
- Filter by languages (i.e. only French language pages from greenparty.ca)
- Or any of the above!

Named Entity Visualization

Data source: greenparty.csv




Manley
22 mentions


Elizabeth
Ottawa
Elizabeth May
Canada
Green Party
Green Party of Canada
Elizabeth MayType
Bush
7047 mentions

Or generate Solr indexes using Warcbase too!

The Canadian Political Part

webarchives.ca

Web Archives for Historical Research - Canadian Politics | Search | Trends | About | Datasets

Welcome to the Web Archives for Historical Research political parties portal. Before diving in, we encourage you to visit our about page.

The Canadian Political Parties and Political Interest Groups Portal

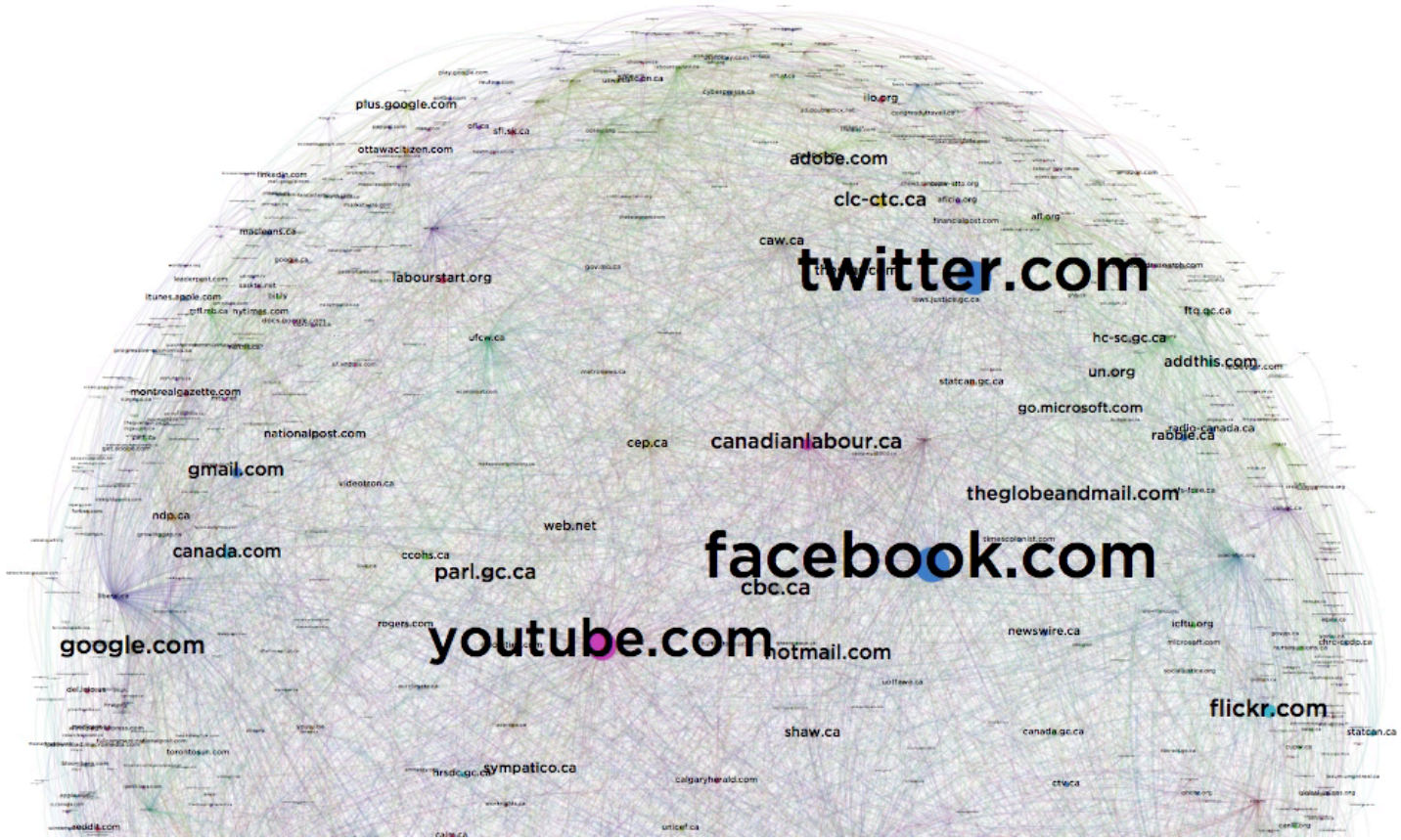
On this website, you can search web archived content from 50 political parties and political interest groups, from October 2005 to March 2015.

Curious how the Liberal Party of Canada responded to the 2008 financial crisis (a search for "recession" in 2008, liberal.ca)? How the Canadian Centre for Policy Alternatives reacted to Michael Ignatieff? Now you can check it all out.

Options include:

- **Basic keyword searching** [Example: "Rob Ford", only Liberal.ca]
- **Graphing trends over time** [Example: Liberal Opposition Leaders, 2005-2015]
- **Advanced search, including words in proximity to each other** [Example: environmental and tax within 25 words of each other]

Below, here are all of the links for the entire time period, visualized below.



Step Five: $$$$

Social Sciences and Humanities Research Council of Canada

Conseil de recherches en sciences humaines du Canada

Canada

Ontario

compute • calcul CANADA

UNIVERSITY OF WATERLOO

It's taken a village to build it.