
- Ming-Hsiang Tsou  mtsou@mail.sdsu.edu, Professor, San Diego State University, USA

The Department of Geography, San Diego State University, USA
Funded by NSF Cyber-Enabled Discovery and Innovation (CDI) program, Award # 1028177. (four years 2010-2014)

http://mappingideas.sdsu.edu/

PI: Dr. Ming-Hsiang (Ming) Tsou (Geography)
mtsou@mail.sdsu.edu
Co-PI: Dr. Dipak K Gupta (Political Science),
dgupta@mail.sdsu.edu
Co-PI: Dr. Jean Marc Gawron (Linguistics),
gawron@mail.sdsu.edu
Co-PI: Dr. Brian Spitzberg (Communication)
spitz@mail.sdsu.edu
Senior Personnel: Dr. Li An (Geography)
lan@mail.sdsu.edu

Graduate Research Assistants:
Ick Hoi (Rick) Kim, Sarah Wandersee,
Kellen Stephens, Jennifer Smith,
Amit Nagesh, Vickie Mellos, & Ting-Hwan Lee,
(Undergraduates: Alejandra Coronado, Luke Kemper)
Spatial Web Automatic Reasoning and Mapping System (SWARMS) prototype

Publicly Accessible Websites

Web search Engines (e.g., Google, Bing)

Raw Text Databases

Combine all search results (ranking, titles, contents, and URLs)

Geo-location & Semantic Mapping

Semantic Web Information Databases

(i.e., keywords + place-names + geo-locations converted from URLs/place-names)

Mapping

Domain Expertise

(Political Science, Linguistics, Communication)

Enhanced Search

Initial Search Refinement

Visualization Maps & Analysis

(GIS tools, gazetteers, cartographic methods, space-time analyses)

Semantic Knowledge Bases

(Keyword clustering, key phrases, concept nomenclature, thesaurus development)

Formalize Ontology

The Semantic Web Automatic Reasoning and Mapping System (SWARMS) framework

(Ming-Hsiang Tsou, Jean Mark Gawron, Dipak Gupta, Brian Spitzberg, Li An, San Diego State University, 2010°)
A GENERIC WEB KEYWORD SEARCH
(“white power”)

The GREEN text is the URL (web address) for each web page.

white power

Also try: white power tattoos, white power music, more...

WhiteHonor
whitehonor.com - Cached

White nationalism - Wikipedia, the free encyclopedia
Views | History | Criticism | Notable organizations
White nationalism is a political ideology which advocates a racial
definition of national identity for white people, as opposed to
multiculturalism, and a separate all-white nation...
en.wikipedia.org/wiki/White_power - Cached

White Power
What does White Power really mean? Is White Power the answer to the survival and
advancement of the White race?
www.stormfront.org/white_power/whitepower.htm - Cached
OUR CYBER-DISCOVERY SEARCH ENGINE
(COMBINE 1000 RESULTS TOGETHER)

Step 1. Select your engines.

- Google
- Bing
- Yahoo

Step 2. Search.

white power search

- Google
- Bing
- Yahoo

Index | Result
--- | ---
1 | WhiteHonor
2 | Aryarn Wear - Aryarn Wear White Power T shirts Nationalist...
3 | WHITE POWER FORUM Skinhead Nazi Discussions
4 | White power skinhead - Wikipedia, the free encyclopedia
5 | White nationalism - Wikipedia, the free encyclopedia
6 | White-Power FAQ
7 | B&H C18 - White Power
8 | White Power
9 | White power music - Listen free at Last fm
Converted to Excel format (with Latitude and Longitude) and Search DATE (Time) – Space-Time Analysis.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Search Engine</th>
<th>Keyword</th>
<th>Search Date</th>
<th>URL</th>
<th>Title</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Yahoo</td>
<td>White power</td>
<td>11/05/2010</td>
<td><a href="http://en.wikipedia.org/wiki/White_power">http://en.wikipedia.org/wiki/White_power</a></td>
<td>White power skinhead - Wikipedia, the free encyclopedia</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Yahoo</td>
<td>White power</td>
<td>11/05/2010</td>
<td><a href="http://www.whitepowerforum.com/">http://www.whitepowerforum.com/</a></td>
<td>WHITE POWER FORUM Skinhead Nazi Discussions</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Yahoo</td>
<td>White power</td>
<td>11/05/2010</td>
<td><a href="http://aryanwear.com/">http://aryanwear.com/</a></td>
<td>Aryan Wear - Aryan Wear, White Power T shirts, Nationalist...</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Yahoo</td>
<td>White power</td>
<td>11/05/2010</td>
<td><a href="http://www.whitehonor.com/FRAMEPAGE">http://www.whitehonor.com/FRAMEPAGE</a></td>
<td>White Victory</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Yahoo</td>
<td>White power</td>
<td>11/05/2010</td>
<td><a href="http://www.power-white.com/">http://www.power-white.com/</a></td>
<td>PowerWhite</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Yahoo</td>
<td>White power</td>
<td>11/05/2010</td>
<td><a href="http://www.crusader.net/texts/wpfaq.html">http://www.crusader.net/texts/wpfaq.html</a></td>
<td>White-Power FAQ</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Yahoo</td>
<td>White power</td>
<td>11/05/2010</td>
<td><a href="http://www.stormfront.org/white_power">http://www.stormfront.org/white_power</a></td>
<td>White Power</td>
<td></td>
</tr>
</tbody>
</table>
USE URLS TO FIND OUT THE LOCATION OF HOST SERVER (EXAMPLE: SDSU.EDU)

- WHOIS databases → host registrant → street address → Latitudes/Longitude
THIS WEB SERVICE LOOKS UP LOCATION DATA FOR A PARTICULAR IP OR A HOST.
Convert to GIS maps (ArcGIS)
Each Website can be associated with a physical location (the web server registration address).

Lat/long = (0, 0).
(unsuccesful geocoding) – 10% in our tests (1000 records).
Visualization maps (Testing Keyword: "Jerry Sanders" in Yahoo.com on MARCH 9, 2011, 978 records, 81 failed in geocoding, 91.7% successful geocoding rate.)

Table Of Contents

- SD-Sanders
- Top-30-cities-1990
- burn-Koran-Jan30
- US-cities
- Cnty94
- states48

Map with geocoded locations from Yahoo search results.
**Kernel point density** function was performed in the ArcGIS using 3 map unit threshold (radius) and 0.5 map unit output scale. 1 map unit = ~ 50 miles.

The ranking of search results were considered as the "popularity" and the "population" in the kernel density algorithm. **population = (1001 - rank#).** A website ranked #1 will be assigned to "1000" (1001 - 1) for its population parameter.

**Compare two keywords:**

Jerry Sanders (San Diego Mayor)
Antonio Villaraigosa (L.A. Mayor)
Map Algebra (Raster-based) in ArcGIS

Using Raster Calculator to compute the differences between two maps (information landscapes)
Map Algebra (Raster-based).

Differential Value = (Keyword-A / Maximum-Kernel-Value-of-Keyword-A) - (Keyword-B / Maximum-Kernel-Value-of-Keyword-B)

The red hotspots in the new map indicate that "Jerry Sanders" is more popular than "Antonio Villaraigosa" in these areas and the blue color areas indicate that "Antonio Villaraigosa" is more popular than "Jerry Sanders".

The differential information landscape map illustrated important geospatial fingerprints hidden in the text-based web search results depending on the context of selected keywords.
Many web pages located in Denver are created by very conservative republicans or anti-illegal immigrant groups. These web pages created a “negative popularity” hotspot in the information landscape. These anti-immigrant groups dislike Villaraigosa very much because he is one of few Hispanic mayors in big cities in the United States.
The following settings of kernel density thresholds for detecting spatial fingerprints at different map scales were used.

- **6 - 8** map units for detecting the State level spatial fingerprints.
- **2-3** map units for detecting the County level spatial fingerprints.
- **0.5 - 1** map units for detecting the City level spatial fingerprints.
- **0.1 - 0.2** map units for detecting the Zipcode level spatial fingerprints.

*Figure 9.* Comparing six different settings of radius distances (threshold) and output grids in the differential maps between “Jerry Sanders” and “Antonio Villaraigosa”.
Different language search top 1000 hits for "Osama bin Laden"

- **English**
  - "Osama bin Laden"

- **Chinese (S)**
  - 奥萨马本拉登

- **Arabic**
  - أسامة بن لادن

**LANGUAGE DEPENDENT!**
“Osama bin Laden” (Geronimo) – (minus) -- Background Constant

Note 1: Hotspots in San Francisco and New York.

**RED:** high density of web pages related to “Osama bin Laden” (comparing to the average web page density in U.S.)

**BLUE:** low density of web pages related to “Osama bin Laden” (comparing to the average web page density in U.S.)
300 random chosen keywords to create 50,000 records (hits).

Punctuation is ignored.

Words that are commonly used, like 'the,' 'a,' and 'for,' are usually ignored (these are called stop words).
Protests started on Jan 25, 2011. On February 11, 2011, following weeks of determined popular protest and pressure, Mubarak resigned from office.)
Protests started on Jan 25, 2011. On February 11, 2011, following weeks of determined popular protest and pressure, Mubarak resigned from office.)
Comparison between Jan 29 and Feb 02
(Black: Increase in Feb (Cairo)
White: Decrease in Feb (Doha? – Qatar, Kyiv? - Ukrainian)

Yahoo Search Engine (Arabic Language) "Egypt freedom" comparison between Jan 29, 2011 and Feb 02, 2011

Legend
• web page geolocations

Web Popularity Increase/Decrease
(Black: Increase in Feb 02) (White: Decrease in Feb 02)

-0.739034951 - 0.593827128
-0.593827128 - 0.448619306
-0.448619306 - 0.303411484
-0.303411484 - 0.158203661
-0.158203661 - 0.012995839
0

0.132211983 - 0.277419806
0.277419806 - 0.422627628
0.422627628 - 0.56783545

Major City RANK
1
2
3
4
5
Space – Time Animation (Whooping Cough)

Whooping Cough
Radius: 3 Cell Size: 0.5

January 17 2011
Suggestion: Cyber-Geography

New Research Direction for Geographers:

- **Marketing** (iPhone, Android, iPad, GIS, GPS with keyword search).
- **National Security**: militia groups, terrorism, radical movements.
- **Infectious Diseases**: SARS, Flu, Whooping Coughs.
- **Natural Disaster Responses** and Recovery: Earthquake, Wildfires, Hurricanes…

- Analyze the SPACE-TIME relationships among these concepts, ideas and events.
“iPhone” popularity [Minus] “Android” popularity = differences between iPhone and Android? (Use Map Algebra method)
Thank You

Q & A

- mtsou@mail.sdsu.edu

Funded by NSF Cyber-Enabled Discovery and Innovation (CDI) program. **Award # 1028177. (four years 2010-2014)**  [http://mappingideas.sdsu.edu/](http://mappingideas.sdsu.edu/)