Volunteered Geographic Information

Spatial Computing – University of Minnesota

Slides from Spatial Computing MOOC (By Brent Hecht)

Volunteered Geographic Information

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1. Know the definition and historical context of volunteered geographic information (VGI)
2. Be able to produce VGI yourself!
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4. Be qualified to assess the pros and cons of VGI for a given problem context.
5. Technical Track: Be able to use VGI in your apps, websites, and other systems

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2014

2013

2012

2011

2010

Main sources of geographic information in the year 2000…

USGS
science for a changing world

Statistics Canada
Statistique Canada

United States Census Bureau

…and many other government agencies

Slides from Spatial Computing MOOC (By Brent Hecht)

"Traditional mapping agencies **have elaborate standards and specifications** to govern the production of geographic information, and employ **cartographers with documented qualifications**."

(Goodchild 2007)

Dr. Mike Goodchild
Professor Emeritus
UC Santa Barbara

Slides from Spatial Computing MOOC (CC BY Brent Hecht)

Formerly required to produce commonly-used geographic information…

Surveying Degree

Cartography Degree

Slides by Brent Hecht Computing MOOC

YOU can produce geographic information!

Slides from Computing MOOC (current)

Search Where am I? Go

Way: Hyde Park (19851241)

Survey of 2014-05-05

Edited 2 months ago by Amaroussi
Version #50 · Changeset #22147523

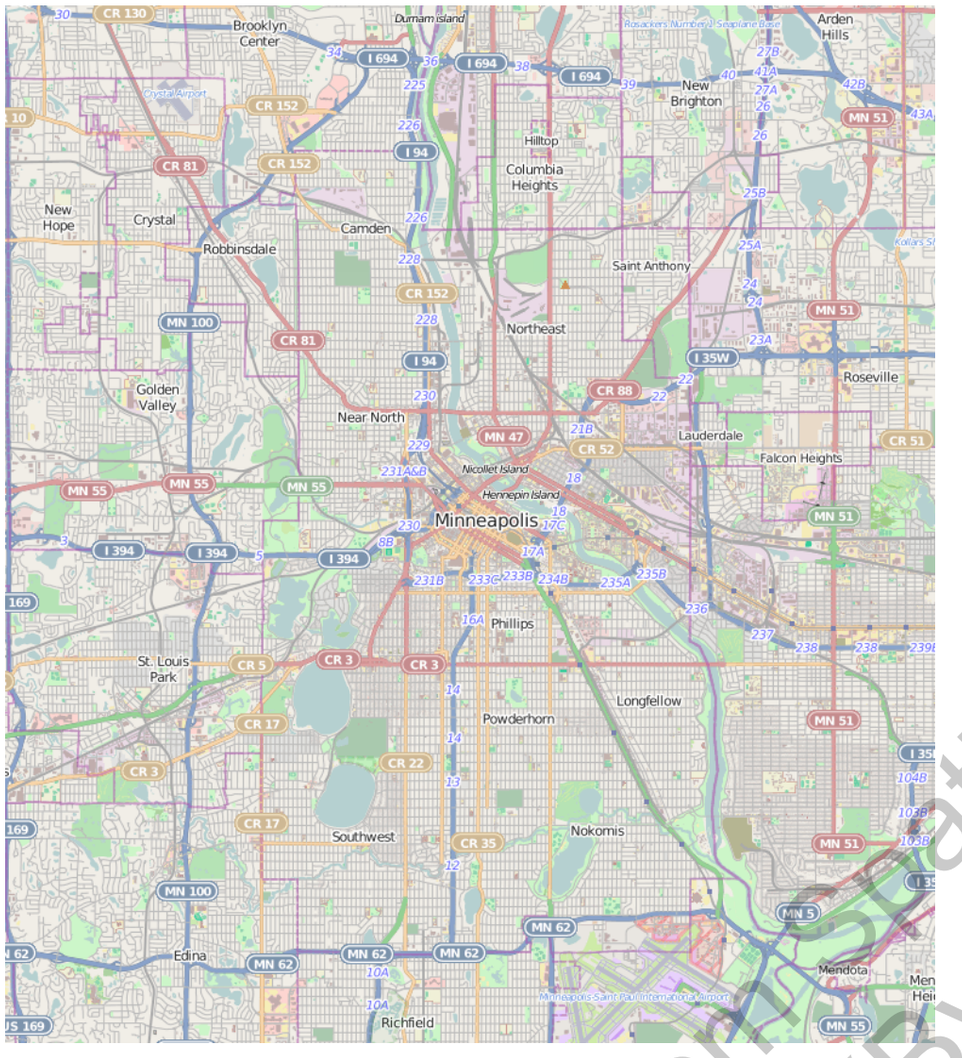
Tags

access	yes
leisure	park
name	Hyde Park
name:he	הייד פארק
name:ru	Гайд-парк
name:uk	Гайд-парк
wikipedia	en:Hyde_Park,_London

Nodes

207610513
671350287 (part of way 52995452)

Slides from Spatial Computing Now (By Brent Hecht)



OpenStreetMap

Apple Maps

foursquare

Foursquare

mapquest

MapQuest

Slides from Spatial Computing Maps (By Brent Hecht)

GroupLens – Google Maps

https://www.google.com/maps/place/GroupLens/@44.9741879,-93.2329747,19z/

Google

Read Later

GroupLens

GroupLens
4-192 Keller Hall
200 Union St SE
Minneapolis, MN 55455

Directions | Save

grouplens.org

(212) 869-0481

Research Institute

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Quick facts · GroupLens Research is a research lab in the Departme...

+Brent

2

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SE Washington Ave

Washington Ave SE

SE Washington Ave

Washington Ave SE

SE Washington Ave

SE Washington Ave

SE Washington Ave

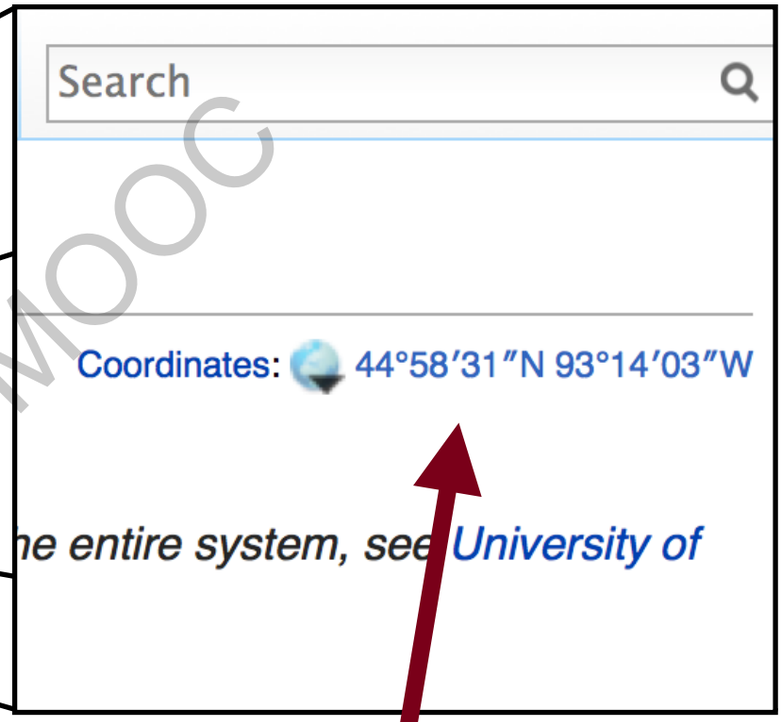
SE Washington Ave

Earth

Google

Map data ©2014 Google Terms Privacy Report a problem 50 ft

Slides from Spatial Computing MOOC (By Brent Hecht)



"Geotag"

Geographic Article

Slides from Spatial Computing MOOC (By Brent Hecht)

Google Earth

Search

Search

ex: Museums in New York, NY

Get Directions History

Places

My Places

Sightseeing Tour
Make sure 3D Buildings

Temporary Places

Layers Earth Gallery

Ocean
Weather
Gallery
Global Awareness
More
Local Place Na…
Parks/Recreati…
Water Body Ou…
Place Categories
Transportation
Traffic
Wikipedia
DigitalGlobe F…
Spot Image
DigitalGlobe C…

Sign in

N

University of Minnesota

Google earth

Tour Guide 1991 Imagery Date: 9/15/2013 44°58'32.68" N 93°14'03.90" W elev 839 ft eye alt 16184 ft

Latitude = 46.777931
Longitude = -92.124996

Spatial Computing MOOC
(by Brent Hecht)

Flickr: Organize your phot...

https://www.flickr.com/photos/organize/?batch_geotag=1&ids=14611837321

Google

Read Later

flickr | Your Photostream | Batch Organize | Albums & Collections | Print & Create | Groups | Map

Drag and drop your photos or videos on to the map!

NEW Save map view | Find a location | GO

You're on page **1** of **1**

7 items taken here

Explore this map

Edit item

DSC05914

from brentosj

1 of 1

Map | Hybrid | Satellite

GREENLAND | ICELAND | SWEDEN | NORWAY | RUSSIA | CHINA | JAPAN | North Pacific Ocean | NORTH AMERICA | UNITED STATES OF AMERICA | MEXICO | North Atlantic Ocean | EUROPE | SPAIN | MOROCCO | ALGERIA | LIBYA | EGYPT | TURKEY | TURKMENIS | IRAQ | IRAN | SAUDI ARABIA | YEMEN | SUDAN | MAURITANIA | NIGER | AFRICA | MYANMAR | THAILAND | PHILIPPINES | INDONESIA | PAPUA NEW GUINEA | VENEZUELA | COLOMBIA | SOUTH AMERICA | ANGOLA | TANZAN

3000 km

2000 mi

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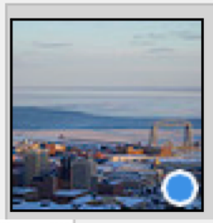
Photos from a batch | SEARCH | More options | Jump to date

1 items from a batch | Reset :: **0** selected | Select all | Need help?



Slides from Spatial Computing MOOC (By Brent Hecht)

Instagram

Slides from Spatial Computing MOOC
(By Brent Eng)

The one million tweet ma...

onemilliontweetmap.com

Google

Read Later

The one million tweet map

powered by maptimize

Slides from Spatial Computing MOOC (By Brent Hecht)

Tweets since page load

- - 2 0 5 3 8

Legend

tweet cluster

lastest tweet

Filters

cluster view heatmap view

keywords filter

hashtags filter

5 most popular hashtags

job (6390) jobs (4894) arg (3478)

tweetmyjobs (3159) wcw (2553)

No Time Filtering

If you want to start with a blank map, click on reset map button (reload the page to see all tweets again).

688526 points

Yay! ! (@ U of M Farmers Market)
https://t.co/ggnSnNAhMc
from @Jake_Rudy at 07/09/2014 12:32

Powered by Leaflet — Data, imagery and map information provided by MapQuest, OpenStreetMap and contributors.

"The vast amounts of data shared on social media reflect people's attitudes, attention, activities and interests, offering unique opportunities to analyze and reason about our world and our society. With associated geotagged information, these social media items allow us to understand, for the first time, what people are paying attention to, and where they pay attention from, in real time. This data can prove hugely valuable to a diverse set of applications, such as improving city management, marketing, journalism, tourism, health and many more."

Dr. Mor Naaman
Associate Professor
Cornell Tech, New York City

Co-founder + Chief Scientist
Seen (http://www.seen.co)

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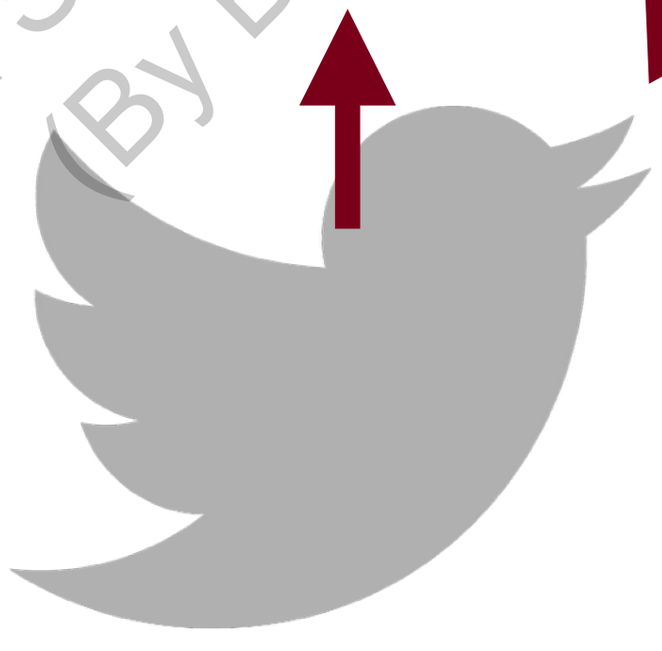
Volunteered Geographic Information



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"[Volunteered geographic information is] the widespread engagement of large numbers of private citizens, often with little in the way of formal qualifications, in the creation of geographic information, a function that for centuries has been reserved to official agencies. They are largely untrained and their actions are almost always voluntary, and the results may or may not be accurate. But, collectively, they represent a dramatic innovation that will certainly have profound impacts on geographic information systems (GIS) and more generally on the discipline of geography and its relationship to the general public."

(Goodchild 2007)

Dr. Mike Goodchild
Professor Emeritus
Dept. of Geography
UC Santa Barbara, USA

Slides from Spatial Computing MOOC (By Brian Tech)

"[VGI is] a profound transformation in **how we know the world**."

(Elwood et al. 2012)

Dr. Sarah Elwood
Professor
Dept. of Geography
Univ. Washington, USA

Slides from Spatial Computing MOOC (By Brent Hecht)

What's this "Volunteered Geographic Information"?

Slides from Spatial Computing MOOC
(By Brent Hecht)

Spatial Computing, circa 2000

We need a module on Volunteered Geographic Information!

Slides from Spatial Computing MOOC
(By Brent Hecht)

Spatial Computing, circa **2014**

Q: How did this BIG change happen?

A: Enabling technologies!

Slides from Spatial Computing MOOC (By Brent Hecht)

Global Positioning System (GPS)

Web 2.0

Slides from Spatial Computing MOOC
(By Brent Hecht)

A: Enabling technologies!

"VGI requires **rethinking many of the important concepts** that geographers have previously used to understand geographic information, its uses, and its impacts."

(Elwood et al. 2012)

Dr. Sarah Elwood
Professor
Dept. of Geography
Univ. Washington, USA

Slides from Spatial Computing MOOC (By Brent Hecht)

Further Reading

Goodchild, M.F. 2007. Citizens as sensors: the world of volunteered geography. GeoJournal. 69, 4 (Nov. 2007), 211–221.

Elwood, S., Goodchild, M.F. and Sui, D.Z. 2012. Researching Volunteered Geographic Information: Spatial Data, Geographic Research, and New Social Practice. Annals of the Association of American Geographers. 102, 3 (2012), 571–590.

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Attributions

"Night-sky-milky-way-galaxy-astrophotography - West Virginia - ForestWander" by ForestWander - http://www.forestwander.com/2010/07/night-sky-milky-way-galaxy-astrophotography/. Licensed under Creative Commons Attribution-Share Alike 3.0-us via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Night-sky-milky-way-galaxy-astrophotography_-_West_Virginia_-_ForestWander.jpg#mediaviewer/File:Night-sky-milky-way-galaxy-astrophotography_-_West_Virginia_-_ForestWander.jpg.

Crown by Edward Boatman from The Noun Project

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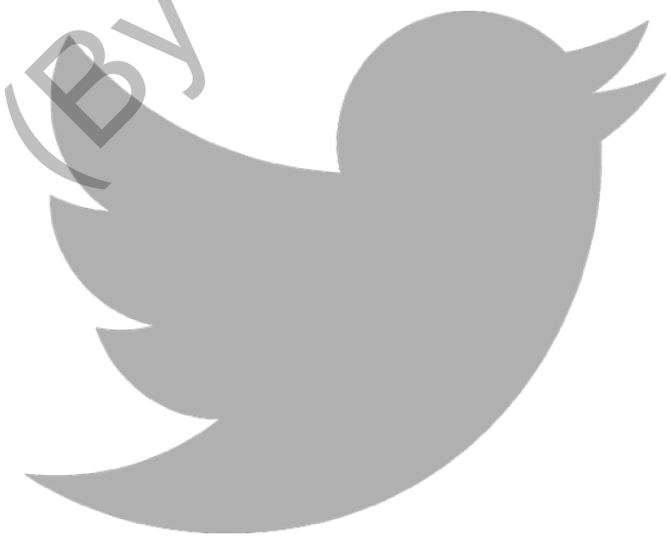

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Slides for Spatial Computing MOOC
(By Brent Hecht)

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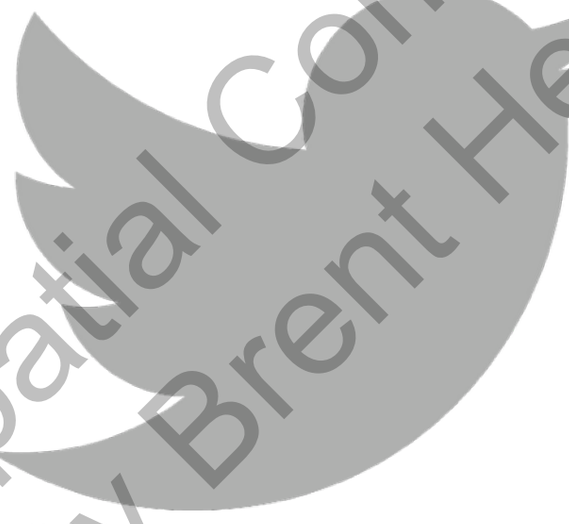

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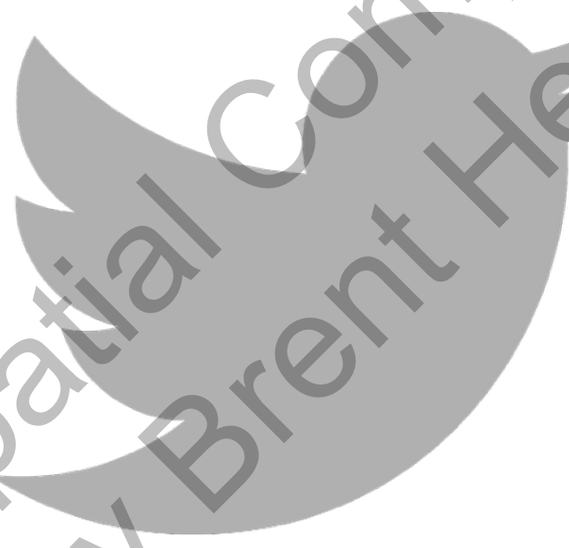
foursquare

tripadvisor

yelp

Audubon
CHRISTMAS BIRD COUNT

facebook



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tripadvisor

yelp

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CHRISTMAS BIRD COUNT

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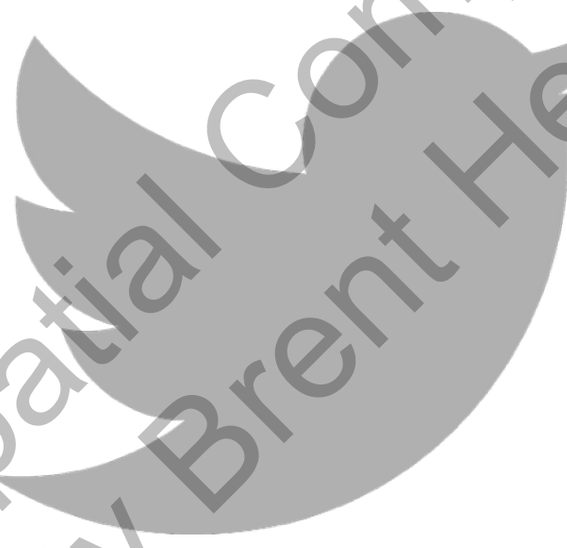

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yelp

Audubon
CHRISTMAS BIRD COUNT

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(By Brent Hecht)

Social Media VGI

Peer-Production VGI

Citizen Science VGI

Slides for Spatial Computing MOOC (Prof. Brent Hecht)

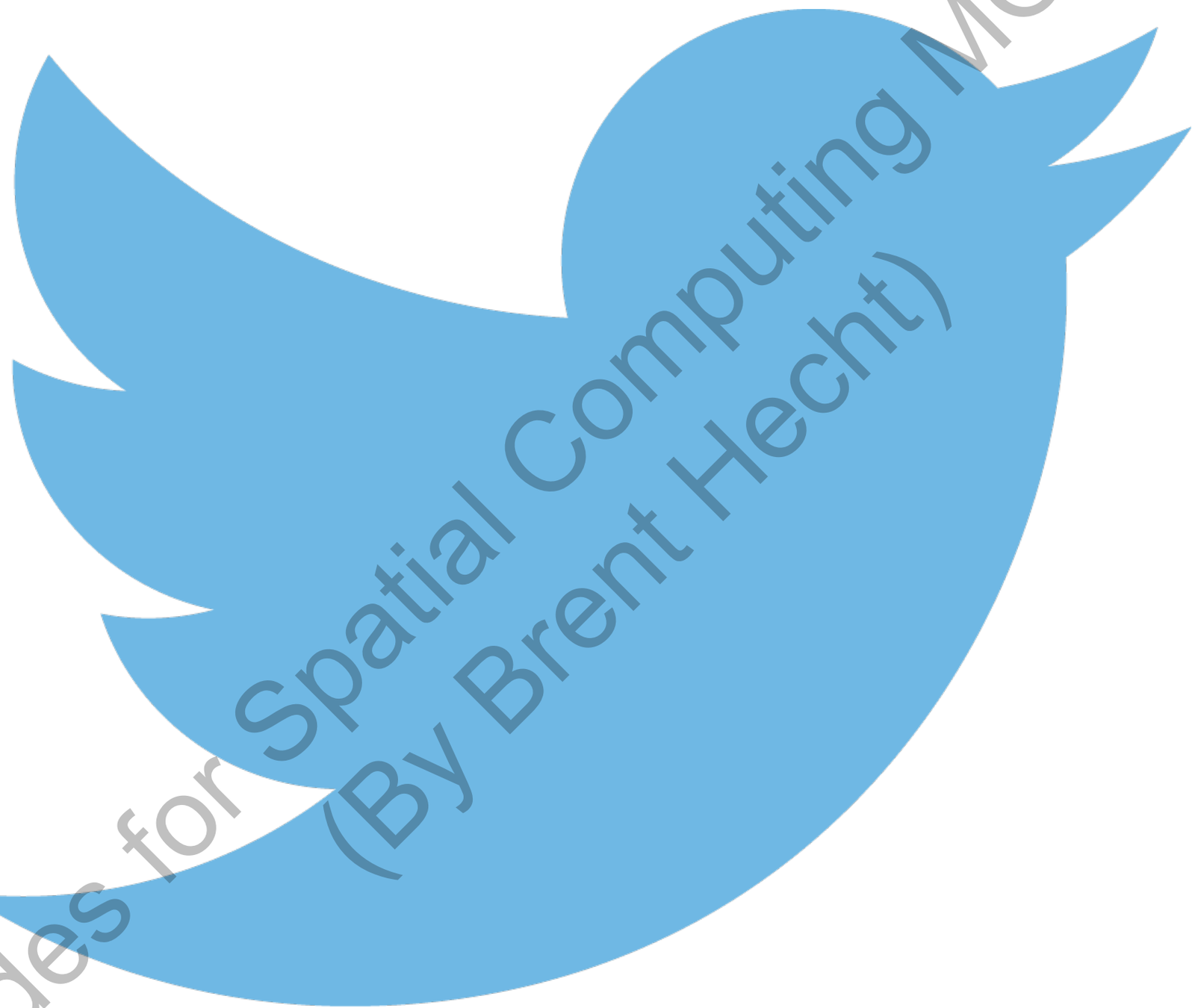
+ Geotag

Latitude = 46.777931

Longitude = -92.124996

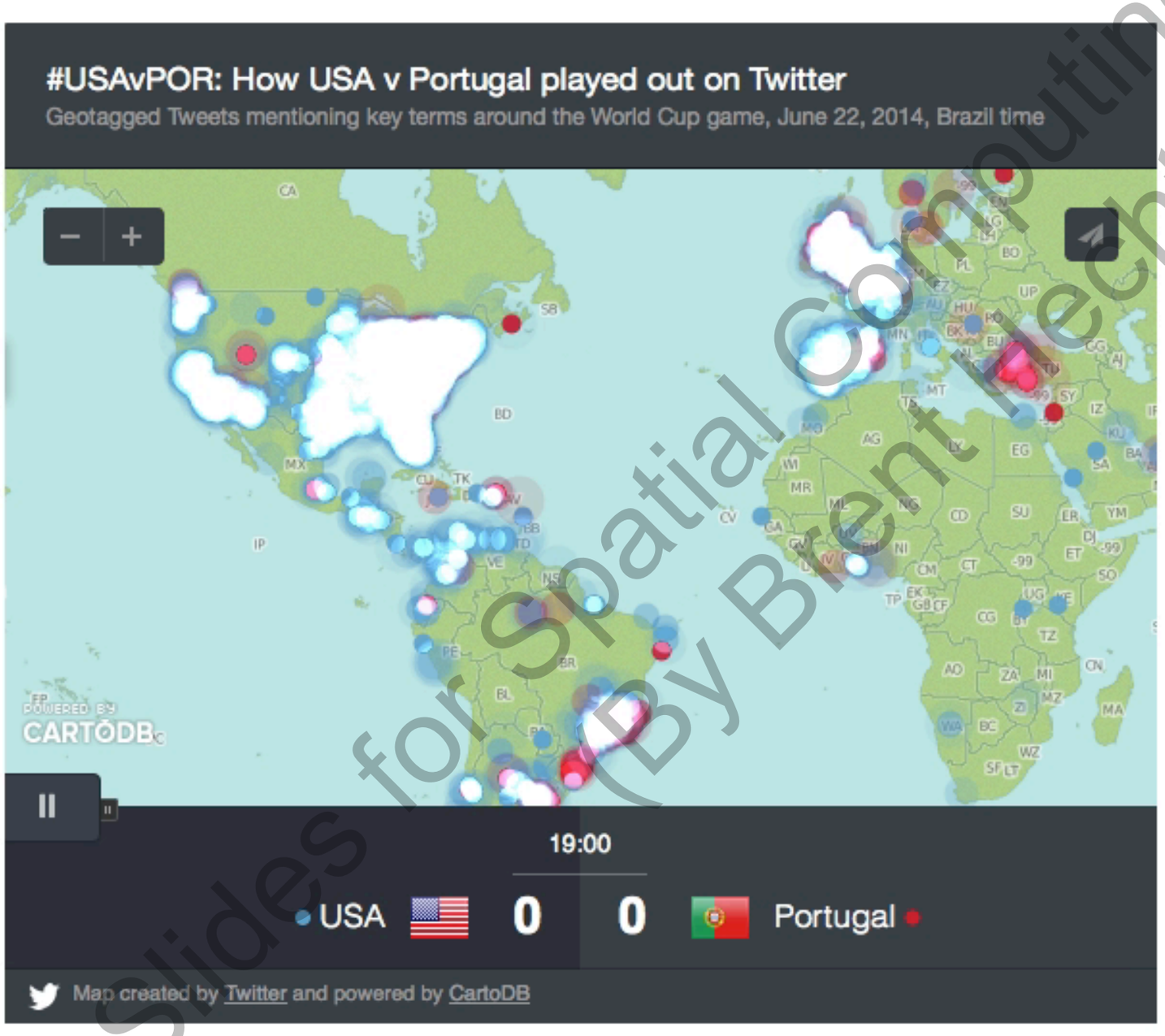
Social Media VGI

Slides for Spatial & Computing MOOC
(By Brent Hecht)


Slides for Spatial Computing MOOC
(By Brent Hecht)

Tweets lit up the map thr...
www.washingtonpost.com/news/morning-mix/wp/2014/06/24/tweets-lit-up-the-map-through-u-
Google

charts when goals were scored — especially at the end of the match, when USA's Clint Dempsey scored to go ahead 2-1 and Portugal's Silvestre Varela suddenly tied the game at the end.



Twitter also charted mentions of "Clint Dempsey," showing a spike to

1 weapons inside hospitals, mosques a...
2 Dedication: The octopus that spent nearly 4 1/2 years sitt...
3 Sixteen-foot swells reported in once-frozen region of Arctic Ocean
4 Two new mysterious craters emerge in Siberia, deepening gi...
5 Cheesecake Factory owns a health advocate's list of me...
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trove trending articles
Drew Barrymore's Half-Sister Found Dead With 'Dozens Of White...
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Orlando Bloom Throws Punch at Justin Bieber in Ibiza Restaura...

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Earthquake Shakes Twitter Users: Real-time Event Detection by Social Sensors

Takeshi Sakaki
The University of Tokyo
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Tokyo, Japan
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Makoto Okazaki
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Yutaka Matsuo
The University of Tokyo
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matsuo@biz-model.t.u-tokyo.ac.jp

ABSTRACT

Twitter, a popular microblogging service, has received much attention recently. An important characteristic of Twitter is its real-time nature. For example, when an earthquake occurs, people make many Twitter posts (*tweets*) related to the earthquake, which enables detection of earthquake occurrence promptly, simply by observing the tweets. As described in this paper, we investigate the real-time interaction of events such as earthquakes, in Twitter, and propose an algorithm to monitor tweets and to detect a target event. To detect a target event, we devise a classifier of tweets based on features such as the keywords in a tweet, the number of words, and their context. Subsequently, we produce a probabilistic spatiotemporal model for the target event that can find the center and the trajectory of the event location. We consider each Twitter user as a *sensor*

currently estimated as 44.5 million worldwide[1]. Monthly growth of users has been 1382% year-on-year, which makes Twitter one of the fastest-growing sites in the world[2].

Some studies have investigated Twitter: Java et al. analyzed Twitter as early as 2007. They described the social network of Twitter users and investigated the motivation of Twitter users [13]. B. Huberman et al. analyzed more than 300 thousand users. They discovered that the relation between friends (defined as a person to whom a user has directed posts using an "@" symbol) is the key to understanding interaction in Twitter [11]. Recently, boyd et al. investigated *retweet* activity, which is the Twitter-equivalent of e-mail forwarding, where users post messages originally posted by others [5].

Twitter is categorized as a micro-blogging service. Microblogging is a form of blogging that allows users to send

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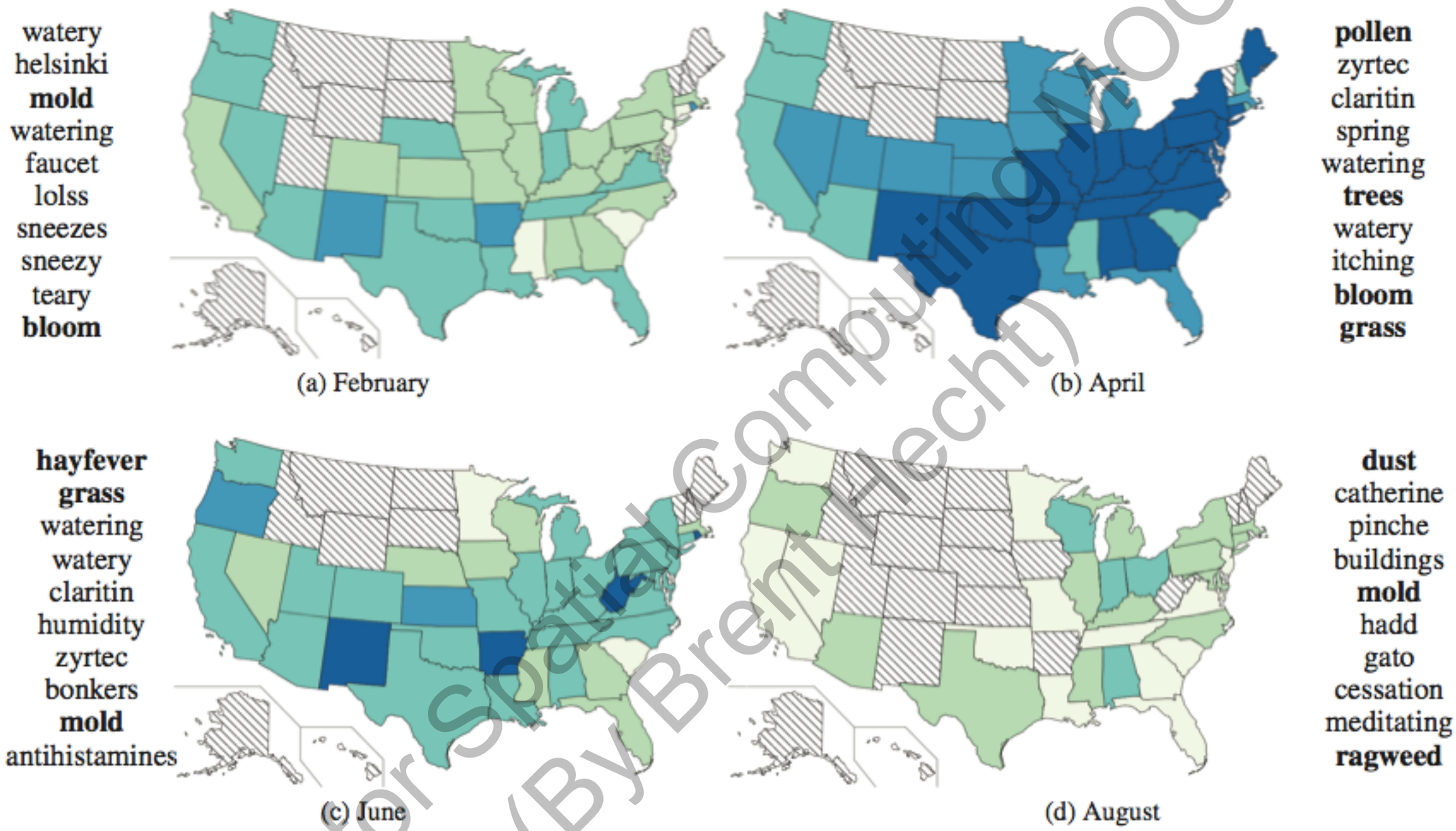

(a) February (b) April

(c) June (d) August

You Are What You Tweet: Analyzing Twitter for Public Health

(Paul and Dredze 2011)

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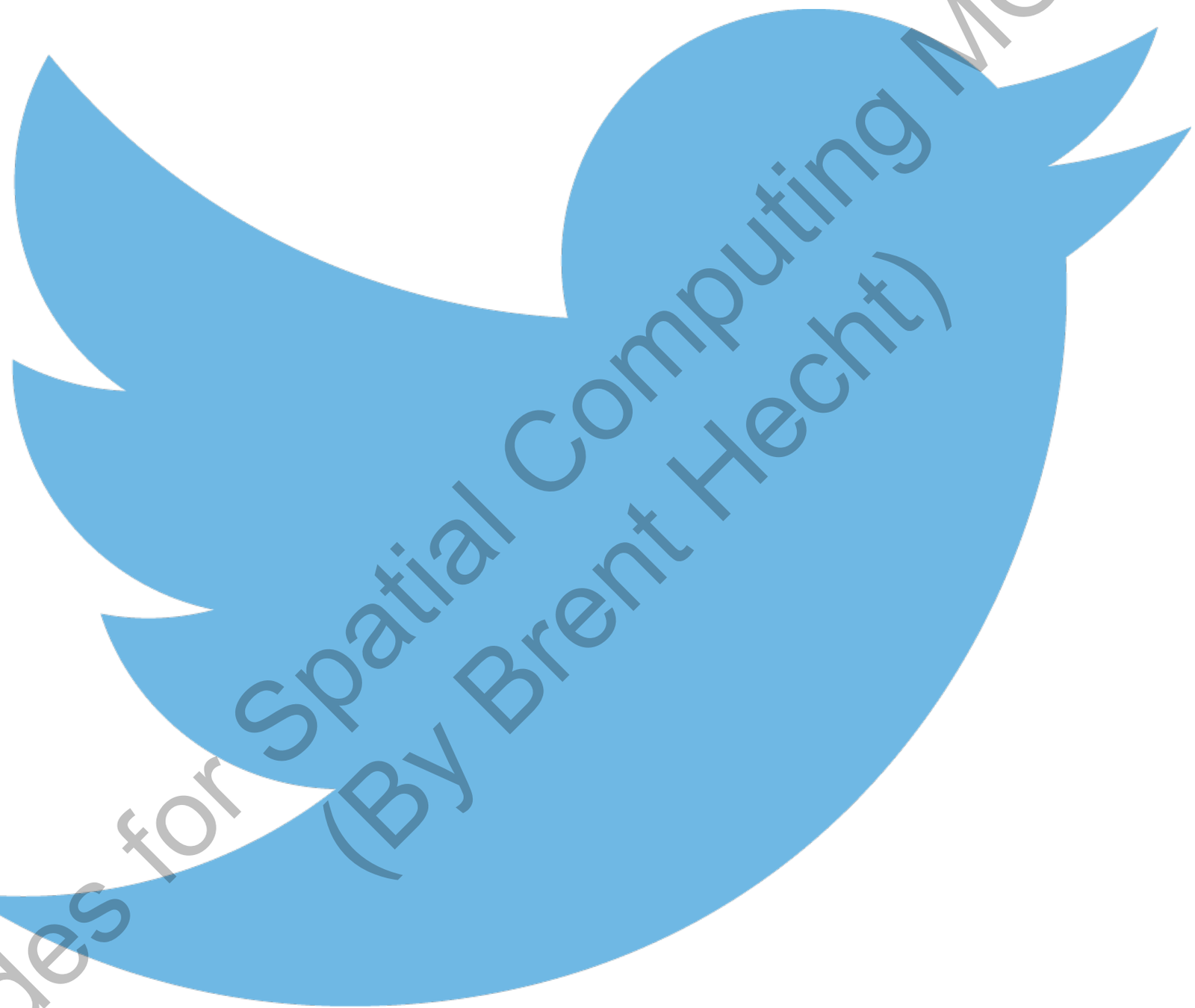
All these cool applications start with the lowly smartphone Twitter application…

Slides for Spatial Computing MOOC
By Brent Hecht)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+ Geotag

Latitude = 46.777931

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Social Media VGI

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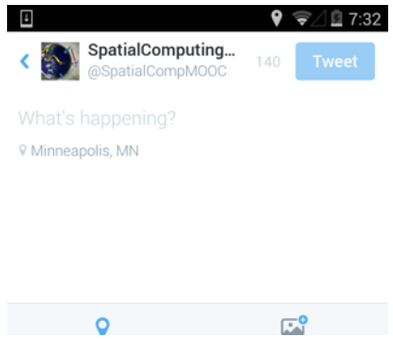
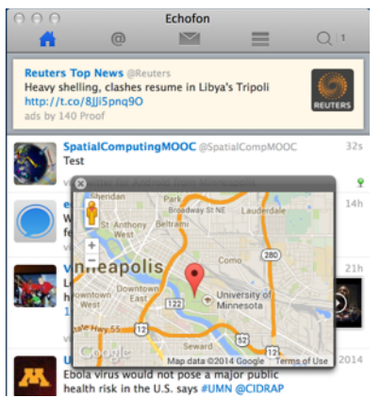
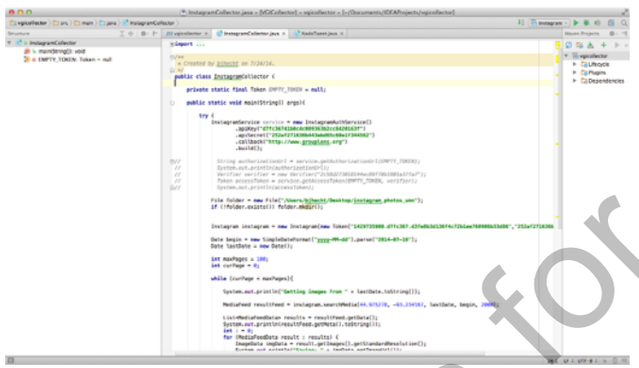


You create content, geotag it, and upload it!



Your friends and contacts (or the general public) can see your geotagged content



In many cases, programmers can download your geotagged content (assuming it's public)

Social Media VGI

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Social Media VGI

Peer-Production VGI

Citizen Science VGI

Slides for Spatial Computing MOOC (Prof. Brent Hecht)

Social Media
VGI

Peer-Production
VGI

Citizen Science
VGI

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"Citizen science is scientific research conducted, in whole or in part, by amateur or nonprofessional scientists, often by crowdsourcing and crowdfunding"

English Wikipedia

Peer-Produced Encyclopedia

The World

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Many citizen science projects rely heavily on measurements that are geographically-referenced!

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Seafloor Explorer

www.seafloorexplorer.org/?utm_source=Zooniverse Home&utm_medium=Web&utm

Google

SEAFLOOR EXPLORER

Home | About | Science | Classify | Profile | FAQ | Talk | Blog

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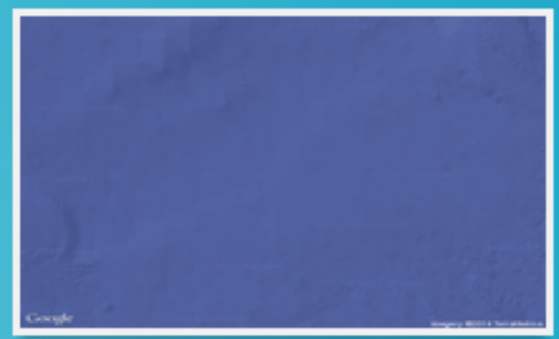
(By Brent Hecht)

Thanks!



Latitude	41.355192°
Longitude	-68.757508°
Depth	15.24 M
Altitude	1.72 M
Salinity	32.454 PSU
Temperature	5.555° C
Speed	4.70 kts

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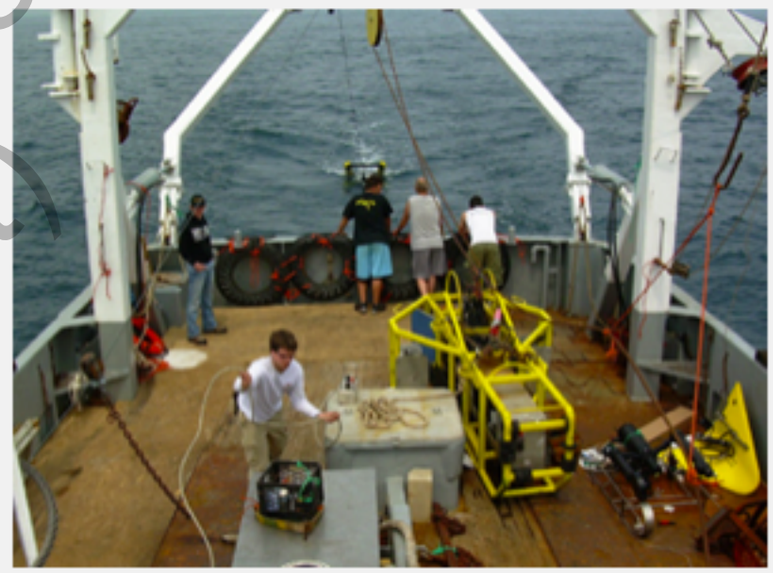
Google

The Science of Seafloor Explorer

HabCam (Habitat Mapping Camera System)

HabCam is a cabled optical and acoustic imaging system that is "flown" from a ship traveling at 5 kts at an altitude of 1 to 3 meters off the bottom at depths to 250m while collecting high resolution still images at a rate of six images per second.



Imaging at this rate provides ~50% overlap to allow for construction of image mosaics of the seafloor. A track approximately 100 nautical miles in length and 259,200 m2 in area is imaged each 24 hour day while at sea. Over 30 million images (>30 TB) have been collected in less than one year of sea time, which demonstrates how quickly this quantity of data can accumulate.

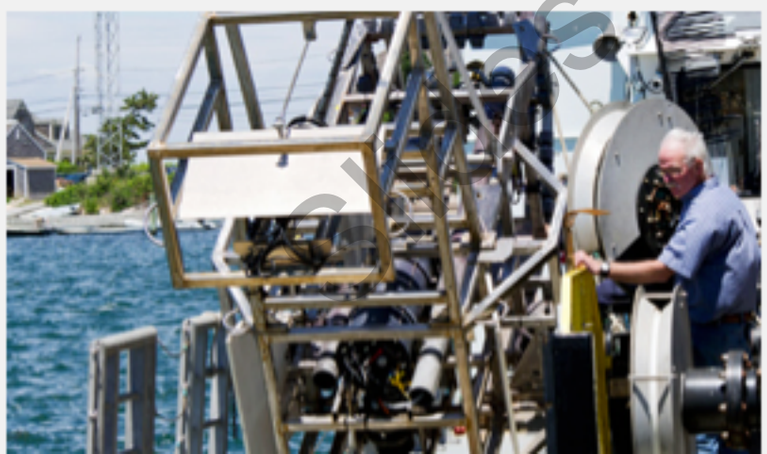
Fauna, flora, benthic maps and more

For the past five years, study areas along the northeast continental shelf have been revisited seasonally, with measurements of all visible macrofauna, and characterization of benthic fauna and flora, oceanic properties (salinity, temperature, nutrients) and substrate type, providing the baseline of an exceptional and unique ecological time series.

Key to extracting useful ecological information from this ever expanding library of image data is development of tools for rapid and accurate segmentation and classification of benthic organisms and substrate, together with visualization of images and their metadata through a Geospatially-explicit, queryable database. As scientists and ecosystem managers, we need to be able to ask questions like *"what is the current distribution and abundance of sea scallop and yellowtail flounder on Georges Bank, and how have they changed over the past few years?"* And, *"where is the invasive tunicate Didemnum vexillum currently co-located with gravel substratum and what is the potential for its' spread to new areas"*.

Enter Seafloor Explorer

The data now exist to answer such ecologically critical questions, but it is buried in hundreds of TBs of images that need to be processed through a defined and scalable pipeline of tools.



Seafloor Explorer is allowing us to capture data on the distributions of sea scallop and other commercially important species as well as defining the substrate and habitat in which they live. This information has never before been acquired on such an expansive (1000s of km) yet high resolution (1mm pixel resolution) scale. While manual classification currently pushes our knowledge and understanding of these distributions, the development of tools for automated segmentation and classification is lagging orders of magnitude behind the rate at which image data are currently being acquired and manually classified.

Using data from Seafloor Explorer we can now begin to build training sets of images and data that will provide the foundation for automated machine vision approaches to target classification from HabCam images. These tools must be developed if the untapped wealth of information available in optical imagery is to be fully realized in

Computing MOOC
(By Brent Hecht)

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https://www.census.gov/geo/maps-data/data/tiger.html

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Geography

Main | About | Maps & Data | Reference | Partnerships | Education | Research

Maps & Data

- Maps & Data Main Page

Maps

- Census Data Mapper
- Reference
- Thematic
- Maps Available for Purchase

Data

- TIGER Products
- Census Geocoder
- Partnership Shapefiles
- Relationship Files
- Gazetteer Files
- Block Assignment Files
- Name Lookup Tables
- Tallies
- LandView

TIGER Products

TIGER = Topologically Integrated Geographic Encoding and Referencing

TIGER products are spatial extracts from the Census Bureau's MAF/TIGER database, containing features such as roads, railroads, rivers, as well as legal and statistical geographic areas. The Census Bureau offers several file types and an online mapping application. Our products are:

- TIGER/Line Shapefiles - New 2013 Shapefiles
- TIGER/Line Geodatabases
- TIGER/Line with Selected Demographic and Economic Data
- Cartographic Boundary Shapefiles
- KML - Cartographic Boundary Files
- TIGERweb

Which product should I use?

Product	Best For...	File Format	Type of Data	Level of Detail	Descriptive Attributes	Vintages Available
TIGER/Line Shapefiles	Most mapping projects--this is our ***most comprehensive dataset***. Designed for use with GIS (geographic information systems).	Shapefiles (.shp) and database files (.dbf)	Boundaries, roads, address information, water features, and more	Full detail (not generalized)	Extensive	2006 - 2013, CD 113
TIGER Geodatabases	Useful for users needing national datasets or all major boundaries for by state. Designed for use in ArcGIS.	Geodatabase (.gdb)	Boundaries, roads, address information, water features, and	Full detail (not generalized)	Limited	2013

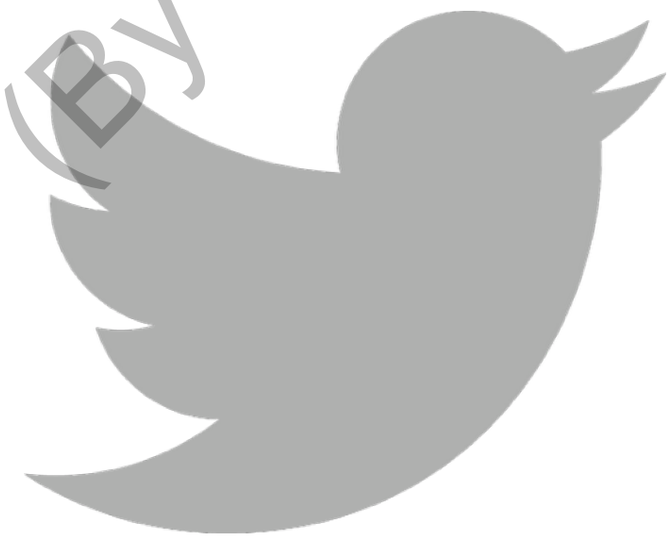
Slides for Spatial Computing MOOC (By Brent Hecht)

Traditional Geographic Information

Volunteered Geographic Information

Spatial Computing – University of Minnesota

Slides for Spatial Computing MOOC
(By Brent Hecht)



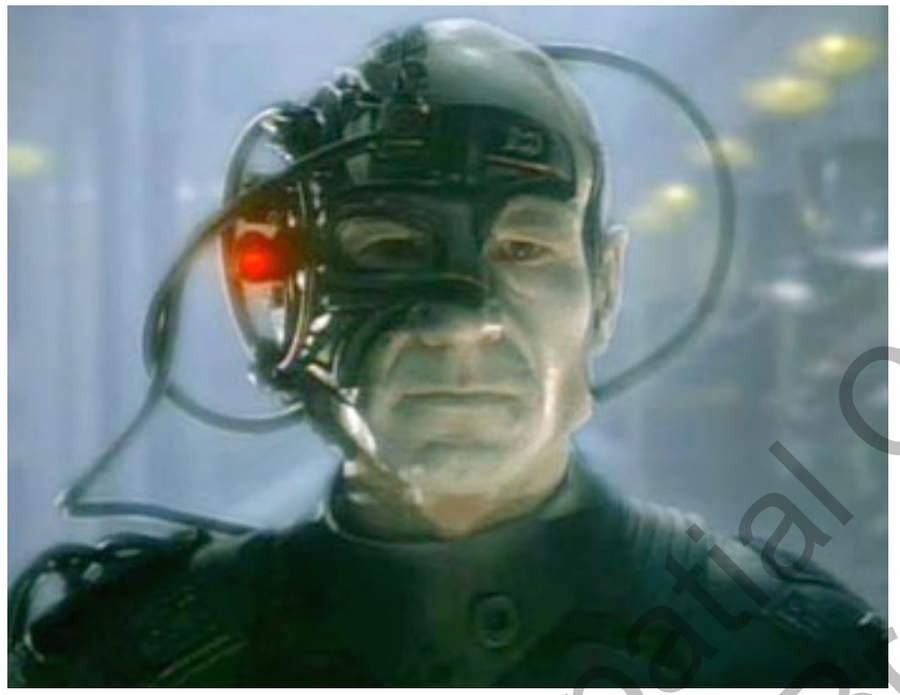
Volunteered Geographic Information

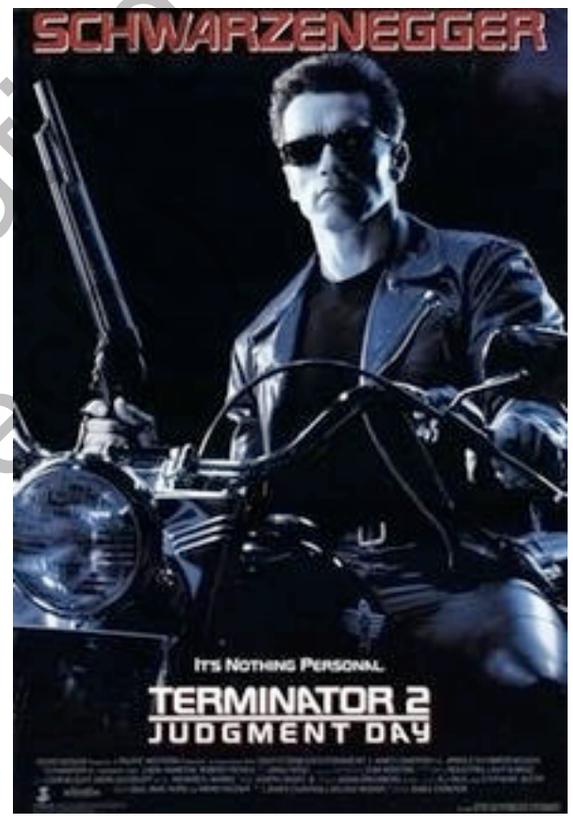
Spatial Computing – University of Minnesota

Learning Objectives

1. Know the definition and historical context of volunteered geographic information (VGI)
2. Be able to produce VGI yourself!
3. Understand the socio-technical systems behind VGI.
4. Be qualified to assess the pros and cons of VGI for a given problem context.
5. Technical Track: Be able to use VGI in your apps, websites, and other systems

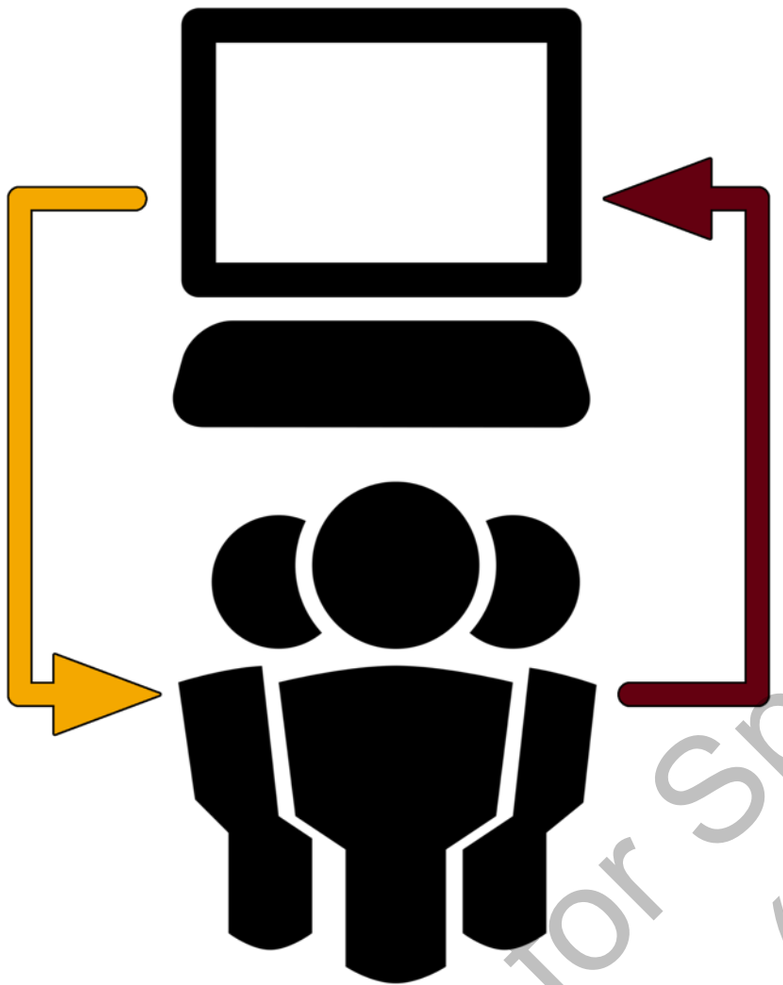
Slides for Spatial Computing MOOC (By Brent Hecht)





Socio-technical System?

Slides for Spatial Computing MOOC
(By Brent Hecht)



Socio-technical System

=

People interacting with each other

+

Technology mediating that interaction

Slides for Spatial Computing MOOC (By Brent Hecht)

Volunteered Geographic Information

😊 PROS 😊

Very large data sets

😣 CONS 😣

Slides for Spatial Computing MOOC
(By Brent Hecht)

3.8+ billion GPS points

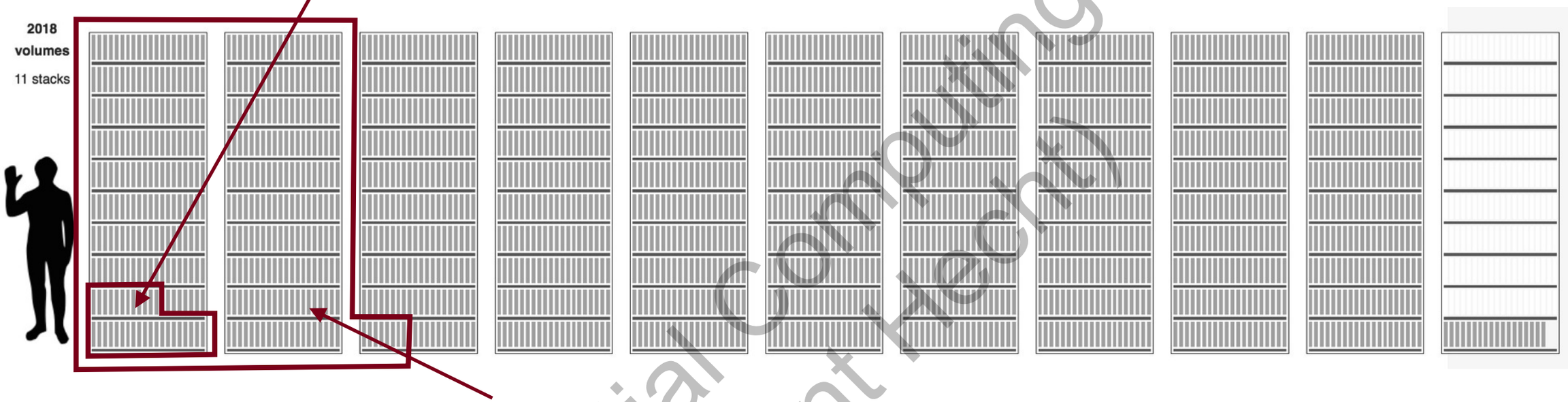
5+ billion check-ins

over a million geotagged tweets per day

new dataset of 49 million geotagged photos

Slides for Spatial Computing MOOC (By Brent Hecht)

Size of final printed version of Encyclopedia Britannica



Approx. size of geotagged content in English Wikipedia

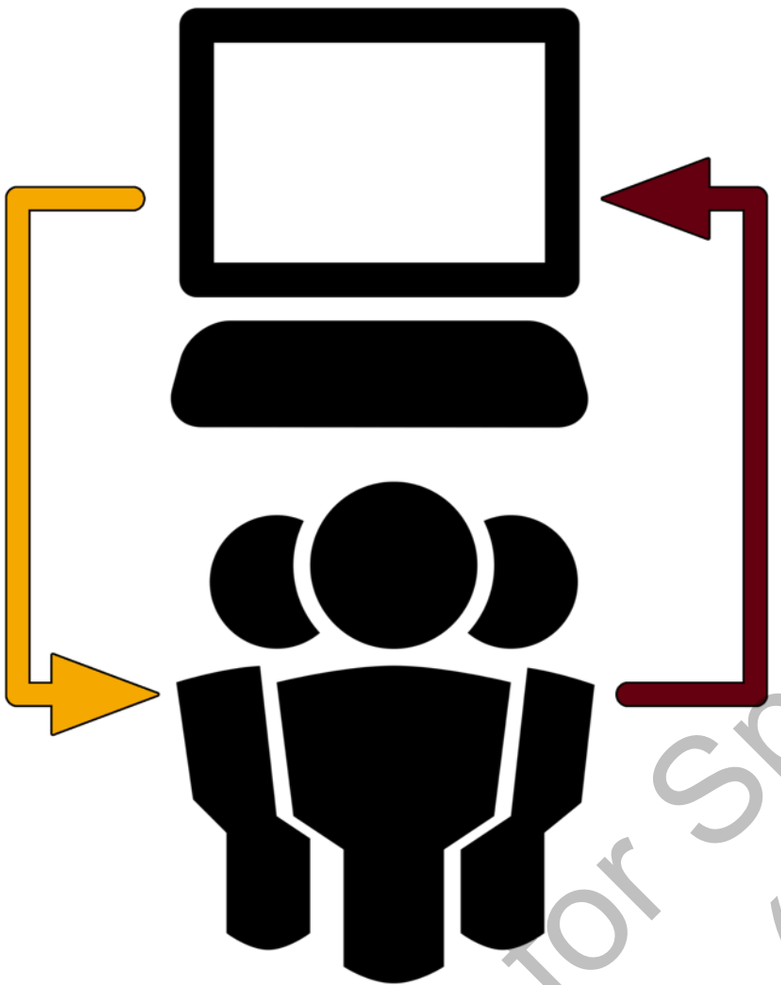
The size of the English Wikipedia in volumes of the Encyclopedia Britannica

(as of April 2014)

Source: http://en.wikipedia.org/wiki/Wikipedia:Size_in_volumes
(Graphic by Wikipedia user Tompw)

Slides for Spatial Computing MOOC (By Brent Hecht)

Slides for Spatial Computing MOOC (By Brent Hecht)



Socio-technical System

=

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Slides for Spatial Computing MOOC (By Brent Hecht)

Recent changes – New York

newyork.wikia.com/wiki/Special:RecentChanges?days=30&limit=500

Google

NEW YORK

On the Wiki | TopContent | Boroughs | Attractions | Transportation | Contribute

Wiki Activity | Random page | Videos | Photos | Chat

Recent changes

Special page

Search this wiki

New pages – New files – Logs

Help:Recent changes

Recent changes options

Show last 50 | 100 | 250 | **500** changes in last 1 | 3 | 7 | 14 | **30** days

Hide minor edits | Show bots | Hide anons | Hide users | Hide my edits | Hide grouped recent changes | Hide logs

Show new changes starting from 15:37, July 14, 2014

Namespace: all Exclude namespace Associated namespace Go

July 7, 2014

09:46 User:Saviour1981 (diff | hist) . . **(+3,865)** . . Saviour1981 (wall | contribs)

June 29, 2014

10:36 Brian A. Levine (diff | hist) . . (-17) . . Saviour1981 (wall | contribs)

June 23, 2014

N 17:38 Depew Park (diff | hist) . . **(+632)** . . Saviour1981 (wall | contribs) *(Created page with ""Depew Park" is a park located in Peekskill, New York. The park is about {{convertl60lacrelm2}} in area. It contains two baseball fields, a football field, a soccer fi...")*

Three edits in the last 30 days

Around Wikia's network

Random Wiki

Lifestyle | Entertainment

Have you seen the new DESTINY trailer? Which class are you?

Slides for Spatial Computing MOOC (By Brent Hecht)

Collaborative communitie...

www.wikia.com/Wikia

Google

wikia | Video Games | Entertainment | Lifestyle | Log in | Sign up

Create. Collaborate. Be Original.

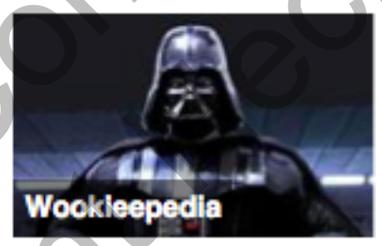
Start a Wikia

Search Wikia

Welcome to the Social Universe For Fans, By Fans!

There are thousands of communities on Wikia. Find yours.

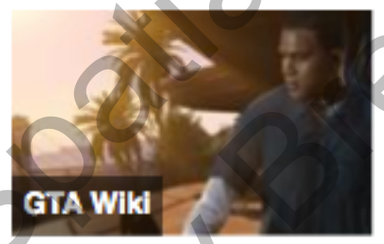
Refresh

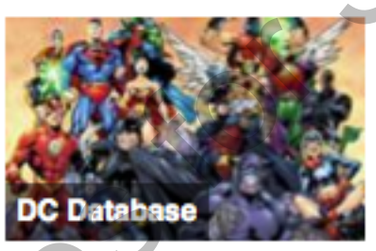


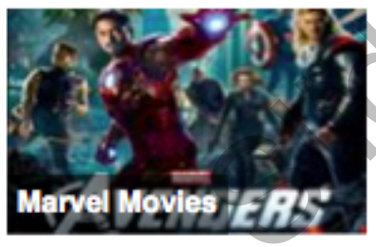
This homepage is curated by #superfan Kharneus from the Brickipedia community.

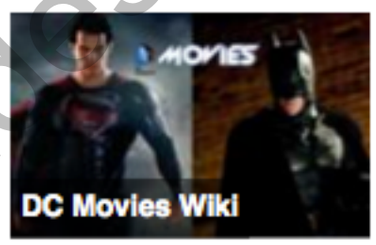
Follow #Superfan on @wikia for your chance to be featured!

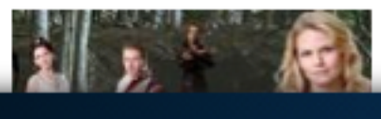
wikia







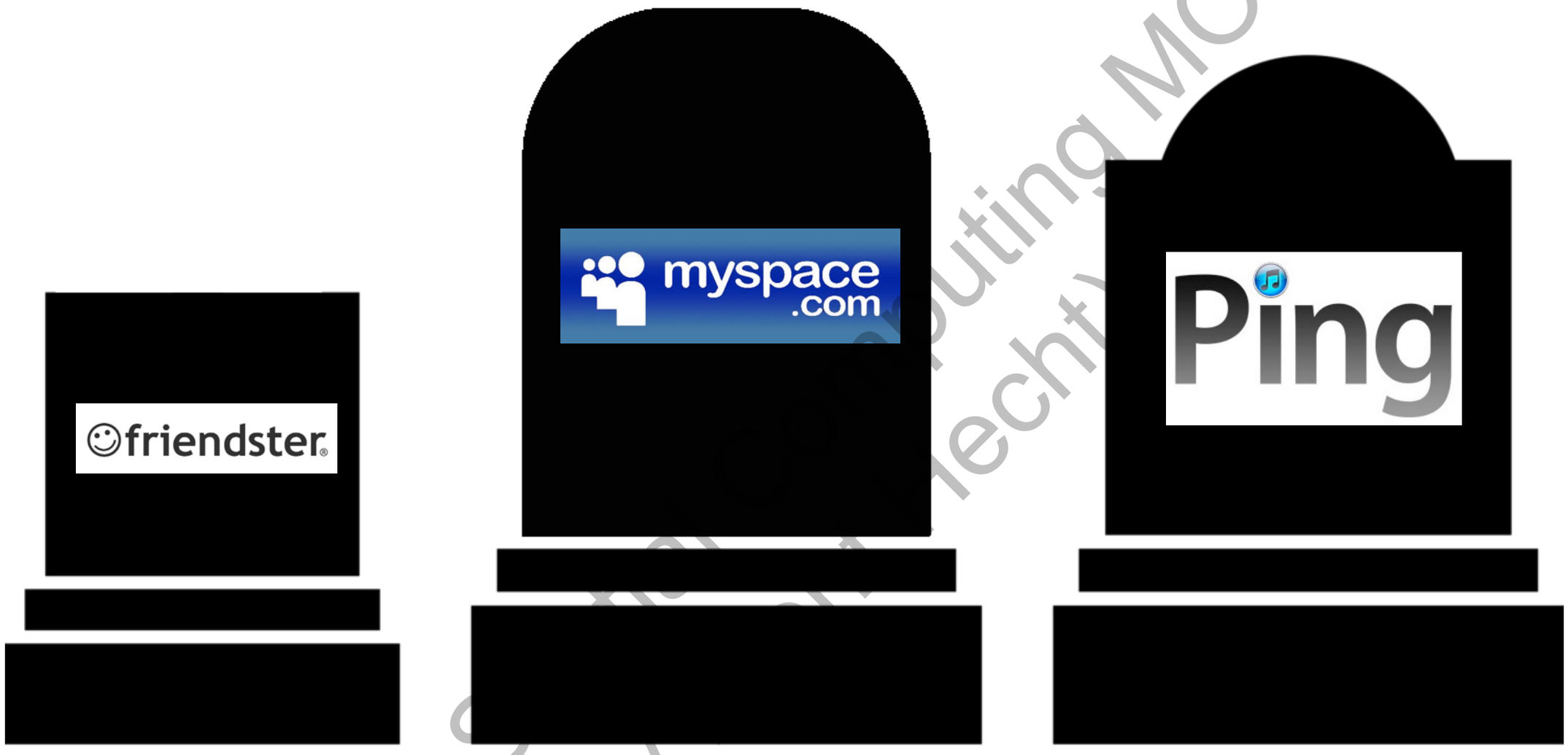




Lifestyle | Entertainment | Video Games

Have you seen the ne

Creative Commons Attribution Non-Commercial Share Alike (By Brian Croxall)



"Here lies social network companies that lost the social component of their socio-technical systems."

Slides for Social Computing MOOC (By Georgia Tech)

Brent

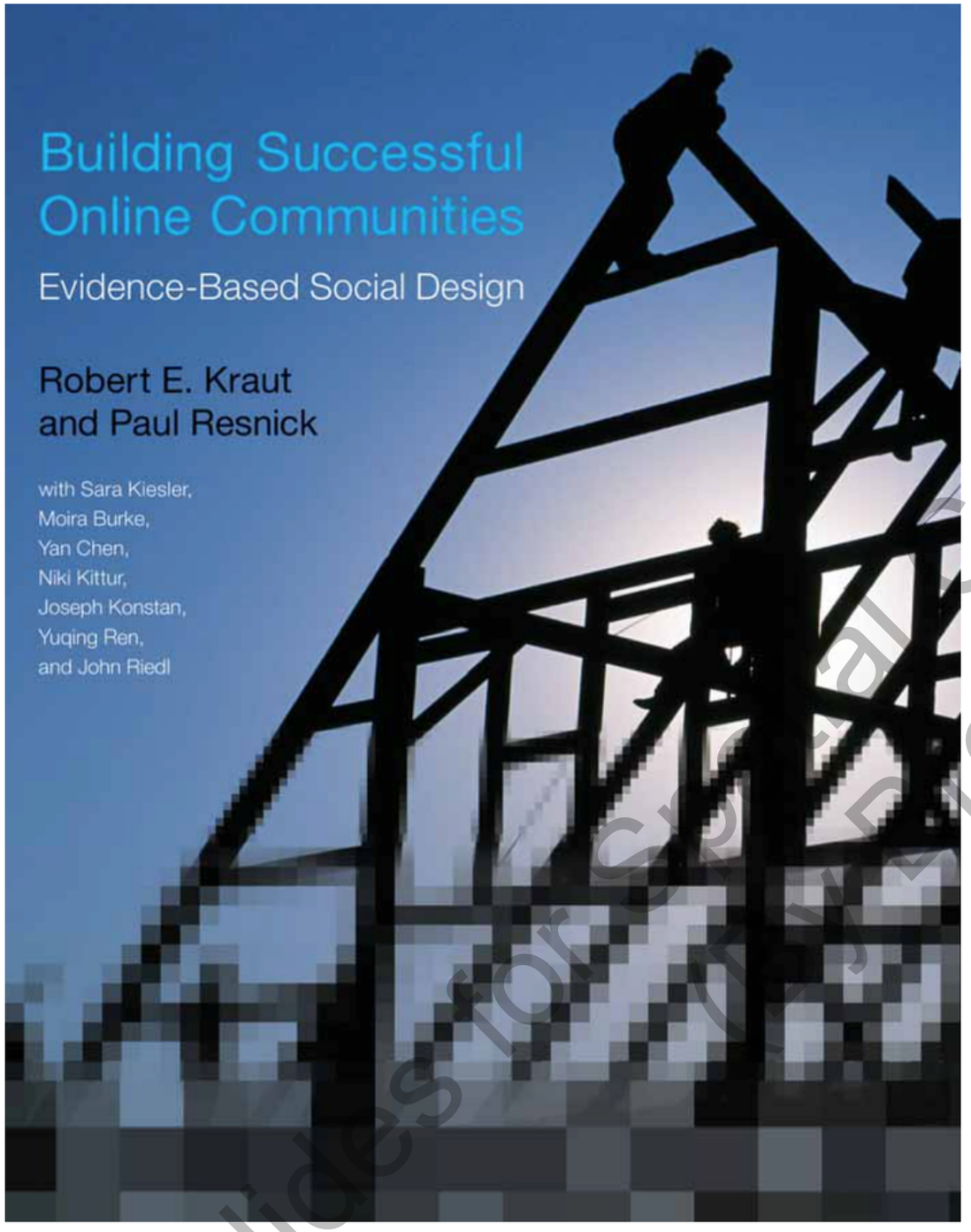
=

Social Computing

+

Spatial Computing

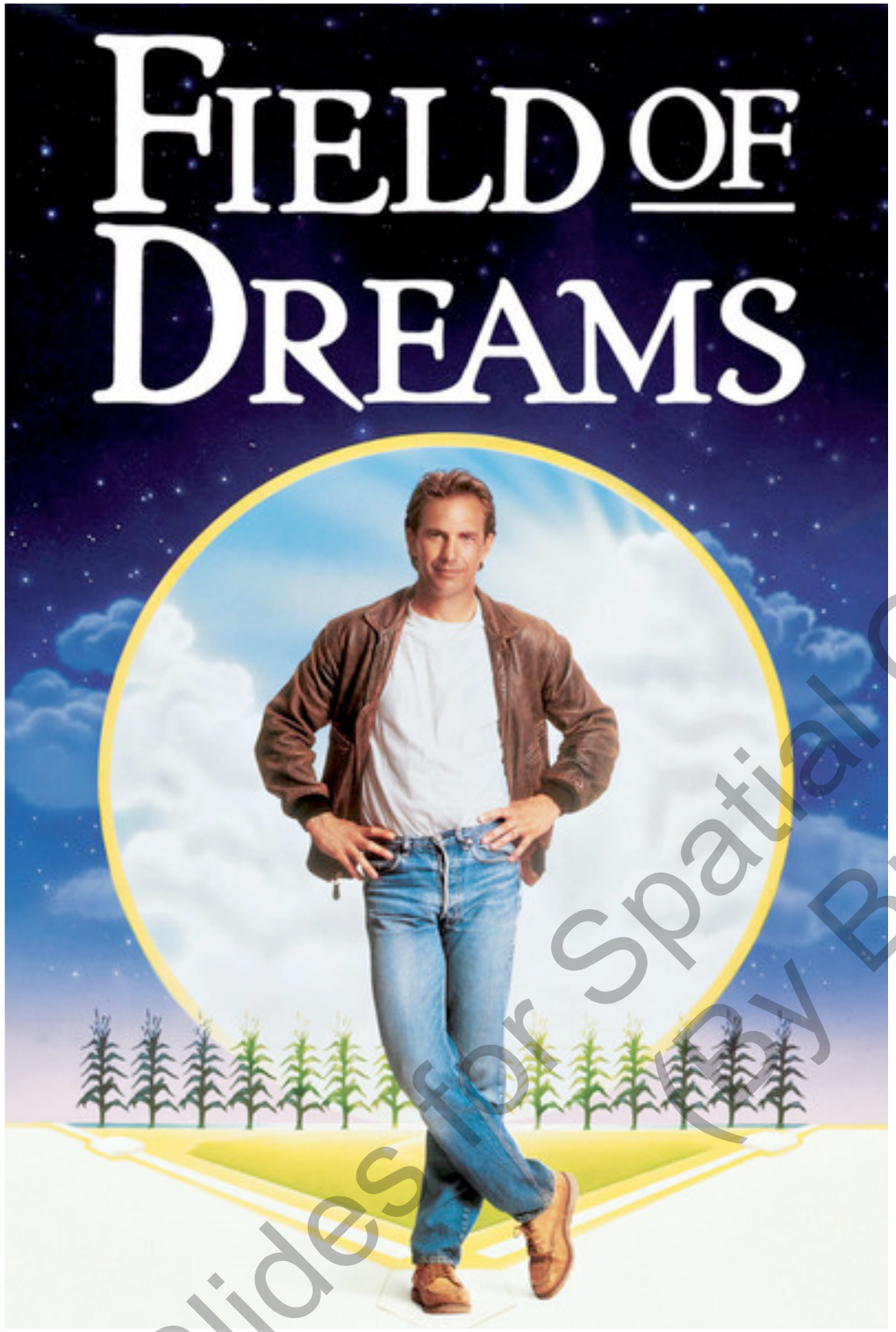
Slides for Spatial Computing MOOC (By Brent Hecht)



Dr. Robert Kraut
Professor
Human-Computer Interaction Institute
Carnegie Mellon University

Dr. Paul Resnick
Professor
School of Information
University of Michigan

Slides for Social Computing MOOC (Robert Kraut & Paul Resnick)

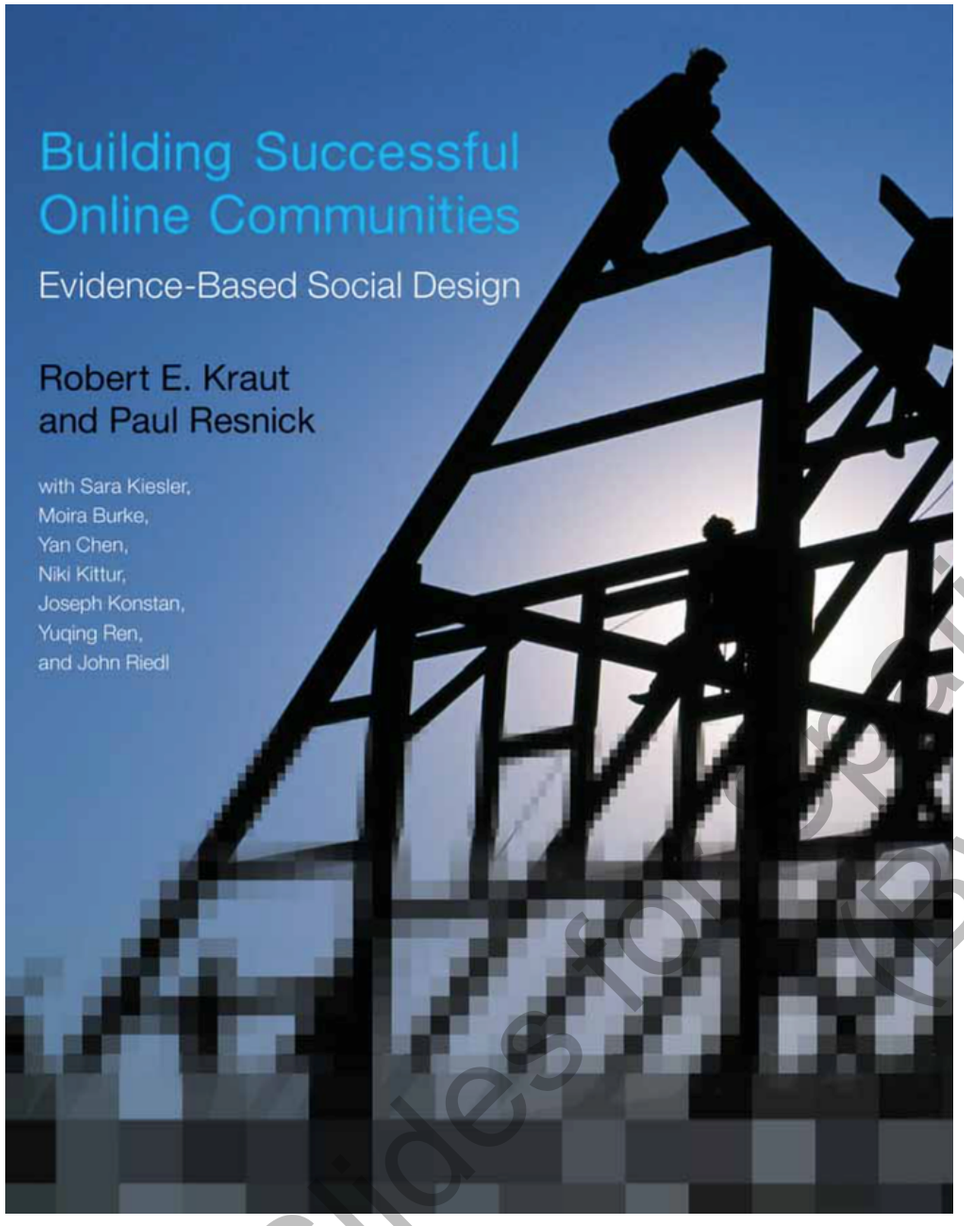


~~"If you build it, they will come."~~

Not for online communities!

Slides for Spatial Computing MOOC
By Brent Hecht

Challenges in creating a new online community that produces VGI (or any other online community):



(1) Carve out a useful niche. Make sure what you're doing is unique and valuable.

(2) Defend that niche in the "ecology of competing communities and alternative ways that potential members can spend their time".

(3) Obtaining a critical mass of users.

Slides for Social Computing MOOC by Brent Hecht

Volunteered Geographic Information

😊 PROS 😊

Very large data sets*

* in important special cases

Often easily downloadable and usable

😣 CONS 😣

Slides for Spatial Computing MOOC
(By Brent Hecht)

All of the VGI in these datasets can be downloaded and used by *anyone*:

geofabrik.de

WIKIPEDIA
The Free Encyclopedia

Slides for Spatial Computing MOOC
(By Brent Hecht)

Slides for Spatial Computing MOOC
(By Brent Hecht)

WikiBrain: Homepage

shilad.github.io/wikibrain/

WikiBrain

View project on GitHub

WikiBrain's busy thinking up its first public release. Please be patient while we fine tune our APIs and complete our documentation. Ask us questions at the WikiBrain google group!

The WikiBrain Java library enables researchers and developers to incorporate state-of-the-art Wikipedia-based algorithms and technologies in a few lines of code.

WikiBrain is easy to use. Wikipedia data can be downloaded, parsed, and imported into a database by running a single command. WikiBrain allows you to incorporate state-of-the art algorithms in your Java projects in just a few lines of code.

WikiBrain is multi-lingual. WikiBrain supports all 267 Wikipedia language editions, and builds a concept-map that co
one language to the same article in another langauge

WikiBrain is fast. WikiBrain uses single-machine **parallelization** (i.e.

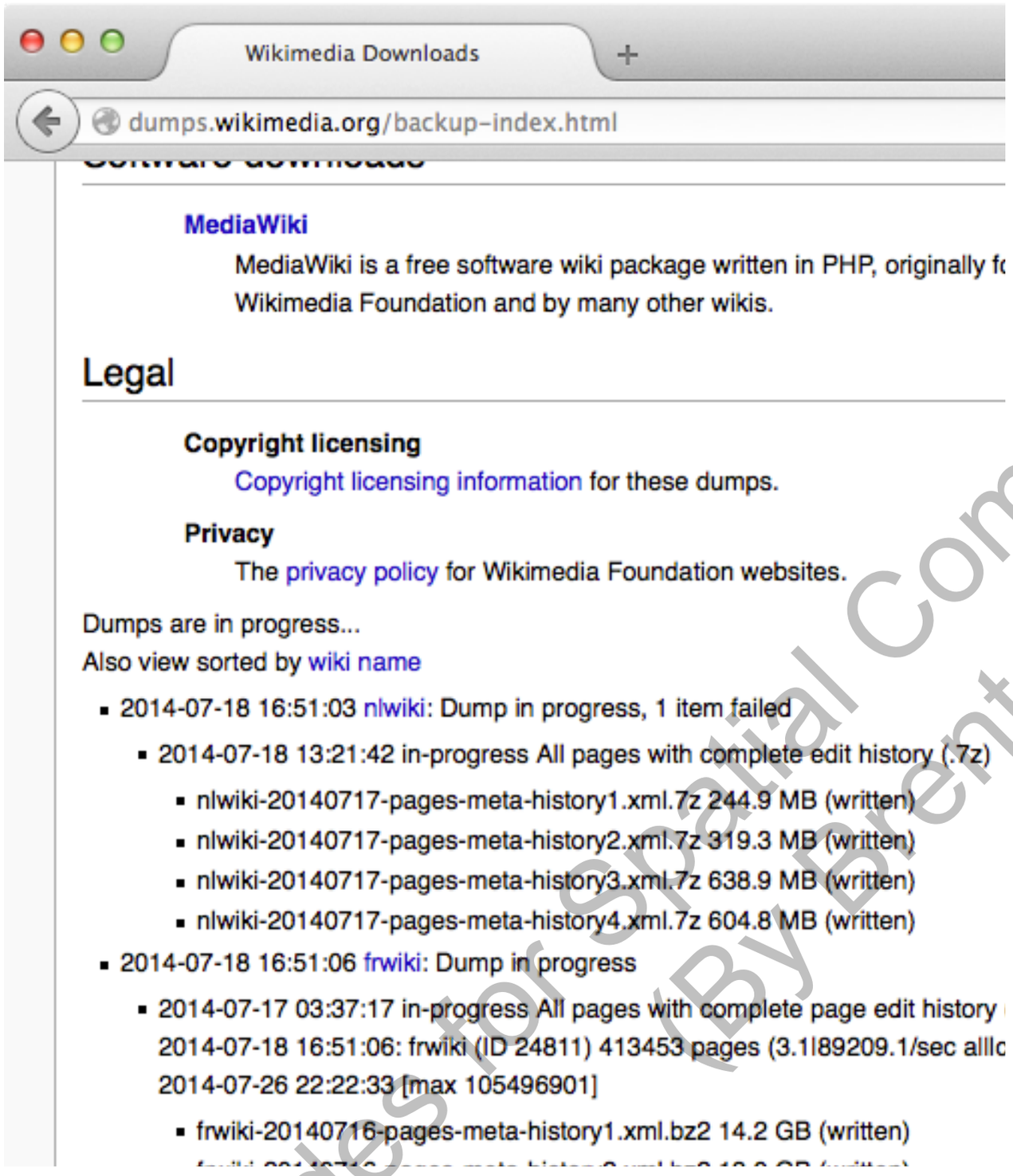
WikiBrain:
- Home
- GitHub
- Google group
- Publications

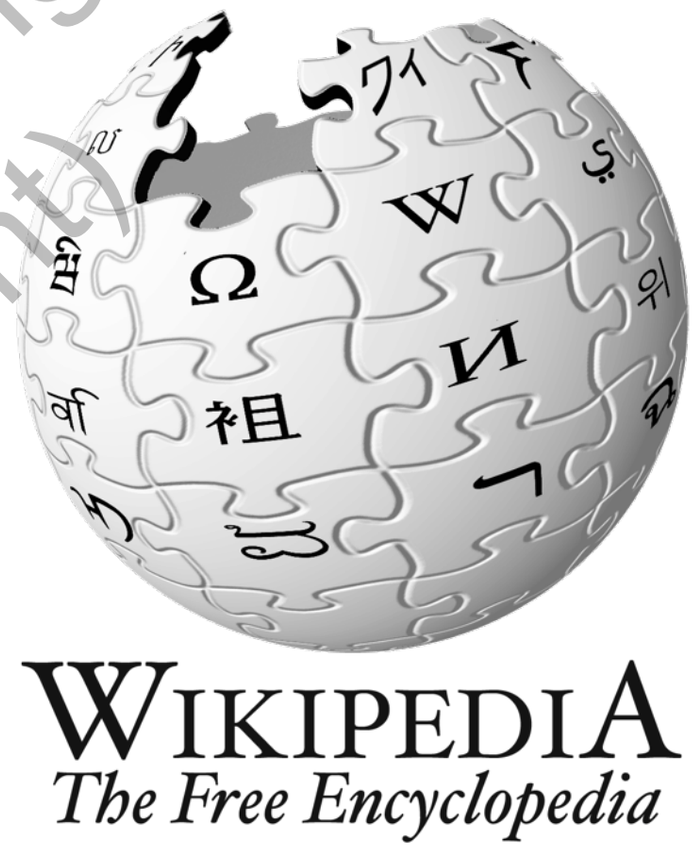
Manual:
- Quickstart
- Installation
- Configuration
- Importing data
- Semantic relatedness
- Wikidata
- Spatial
- Page views

Maven dependency:

```
<dependency>
    <groupId>org.wikibrainapi</gr
```

http://www.wikibrainapi.org





dumps.wikimedia.org

you can download all of Wikipedia here!

Slides for Spatial Computing MOOC (By Brent Hecht)

facebook

Geotagged Photos

Geotagged Tweets

API

Application Programming Interface

You!

Slides for Spatial Computing MOOC (By Brent Hecht)

Common limitations of APIs for social media VGI:

(1) You only can access a sample of the data.

Slides for Spatial Computing MOOC
(By Brent Hecht)

The free Twitter Streaming API has…

~1%

of all tweets

~90%

of all *geotagged* tweets!

(Morstatter et al. 2013)

Slides for Spatial Computing MOOC
(By Brent Hecht)

Common limitations of APIs for social media VGI:

(1) You only can access a sample of the data.

(2) You can't do what you want with the data (e.g. no sharing).

Slides for Spatial Computing MOOC (By Brent Hecht)

Common limitations of APIs for social media VGI:

(1) You only can access a sample of the data.

(2) You can't do what you want with the data (e.g. no sharing).

(3) Rate limits: you can't download data as fast as you may want.

Slides for Spatial Computing MOOC (By Brent Hecht)

Volunteered Geographic Information

😊 PROS 😊

Very large data sets*

* in important special cases

Often easily downloadable and usable*

* subject to API limitations

😣 CONS 😣

Slides for Spatial Computing MOOC (By Brent Hecht)

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Unprecedented source of “platial” info

😣 CONS 😣

Slides for Spatial Computing MOOC (By Brent Hecht)

Space and Place

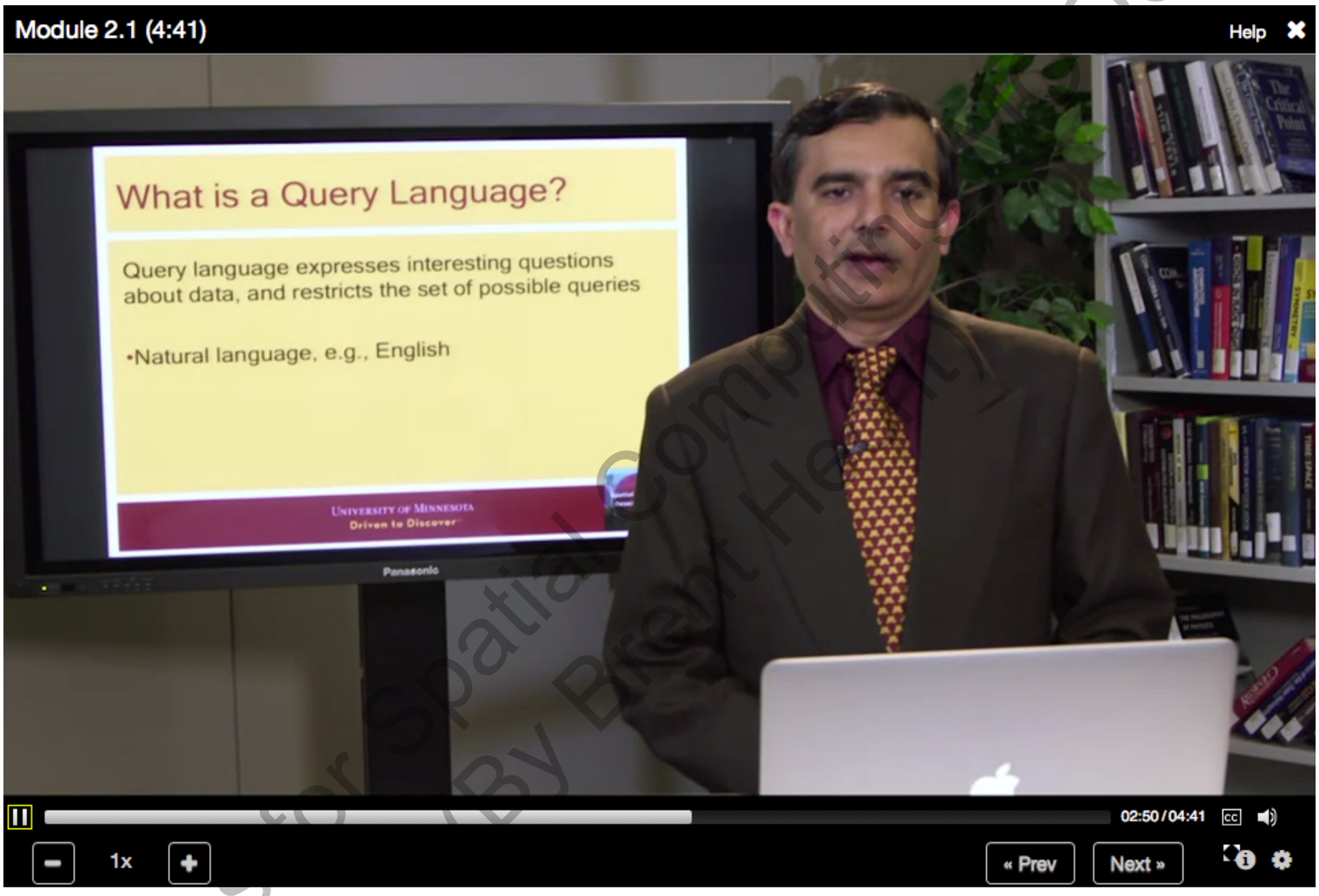
Slides for Spatial Computing MOOC
(By Brent Hecht)

Space and Place

Space

- positions on surface of Earth
- points, lines, polygons, raster cells
- the basis of pretty much all traditional geographic information systems

Slides for Spatial Computing MOOC
(By Brent Hecht)



Space, not place

Slides for Spatial Computing (By Brent Hecht)

Space and Place

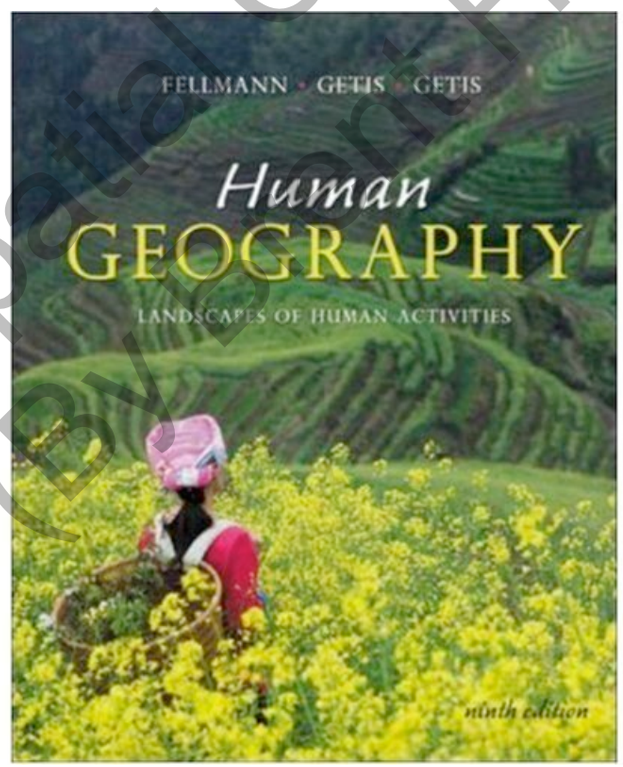
Place

- "humanized space" - Yi-Fu Tuan
- personal and emotional connections to a space
- individual, but can be similarities among people

Slides for Spatial Computing MOOC (By Brent Hecht)

"Place refers to the attributes and values we individually associate with a location."

(Fellman et al. 2007)



Slides for Spatial Computing MOOC
(By Brent Hecht)

Seattle Seahawks

San Francisco 49ers

Computing MOOC
(By Brent Hecht)
Slides for Personal Use

Connecting...

www.foxsports.com/nfl/story/seattle-seahawks-defeat-san-francisco-49ers-to-fac

Google

Super Seattle: Seahawks rally past 49ers in rough, wild NFC title game

PHOTO PHOTO

Richard Sherman celebrates with Seahawks fans after winning the NFC title.

AP Associated Press

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UPDATED JUN 2, 2014 1:55 PM ET

SUBMIT

FOX FOOTBALL DAILY
WEEKNIGHTS 6P ET

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NFL VIDEOS

Best Person in Sports: Keenan Lewis
Posted: Jul 15, 2014
Saints CB Keenan Lewis hosts a back-to-school event, giving children medical ser...

NFL Roundtable: New York Jets
Posted: Jul 14, 2014
They're a team with plenty to prove and a roster of players primed to get it don...

NFL Roundtable: Detroit Lions
Posted: Jul 11, 2014
A team with so many weapons, is this the season that the Lions put together and ...

MORE FOXSPORTS VIDEO »

NFL HEADLINES

Slides for Computing MOOC Prentice Hall

Space and Place

CenturyLink Field

(x1,y1),(x2,y2),(x3,y3), …

+ Anger, Frustration, Sad Memories

+ Happiness, Confidence, Excitement

Space

Traditional Geographic Information, OpenStreetMap VGI

Place

Social Media VGI

Slides for Spatial Computing MOOC (By Brent Hecht)

Geotagged tweets + Sentiment Analysis

blue = sad

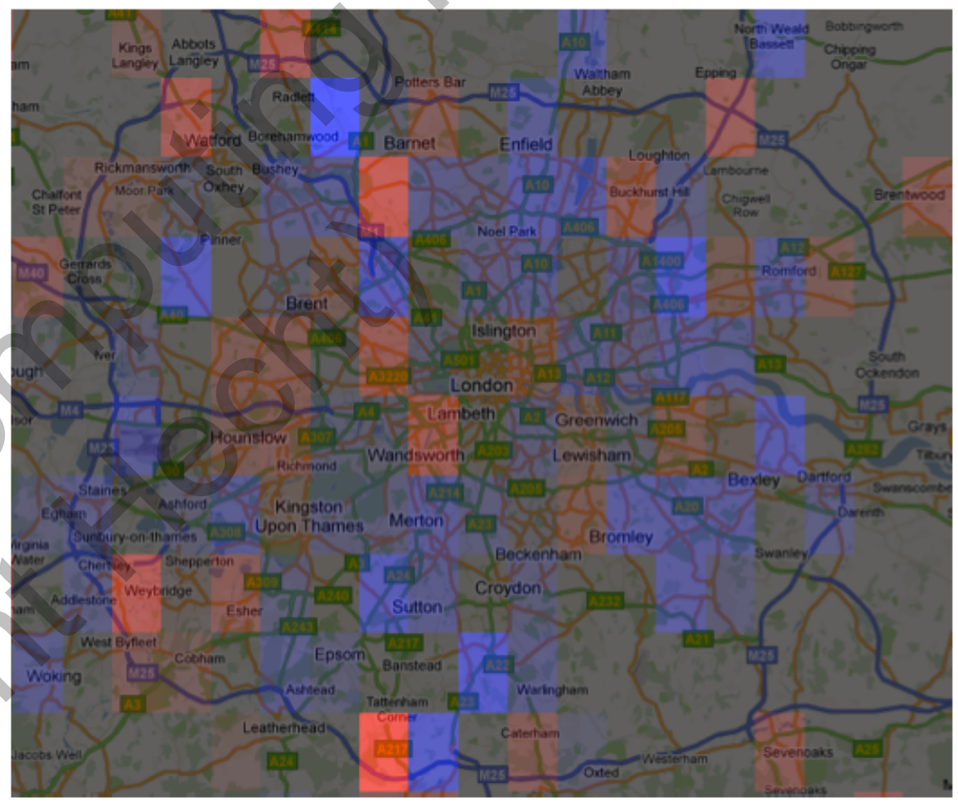

Figure 2. Mapping "Gross Community Happiness" in Greater London (best seen in color).

(Quercia et al. 2012)

Slides for Spatial Computing MOOC (By Brent Hecht)

positive sentiment

Slides for Spatial Computing MOOC (By Brent Hecht)

Volunteered Geographic Information

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Very large data sets*

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Often easily downloadable and usable*

* subject to API limitations

Unprecedented source of “platial” info

😣 CONS 😣

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Coverage biases

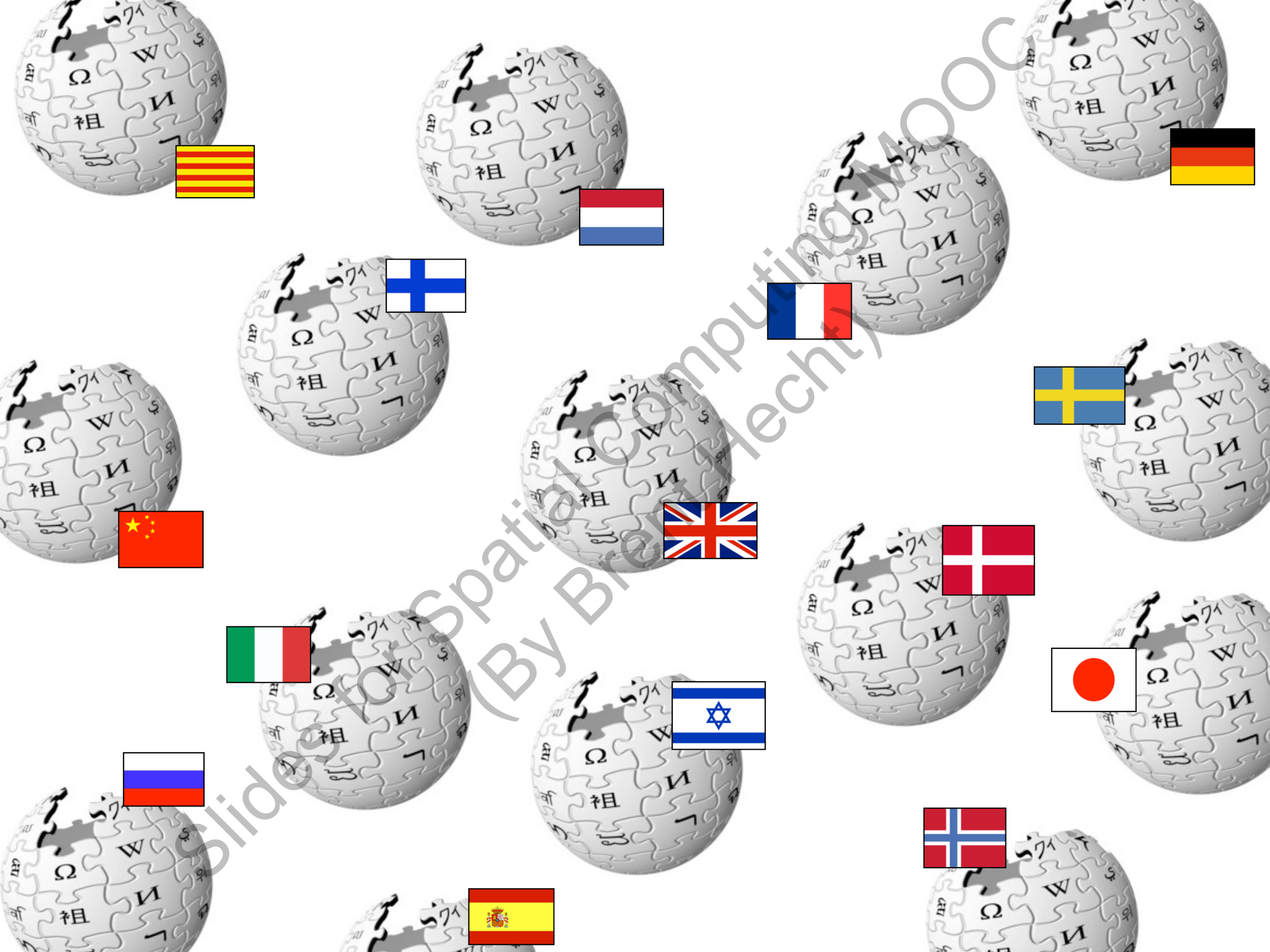
Slides for Spatial Computing MOOC (By Brent Hecht)

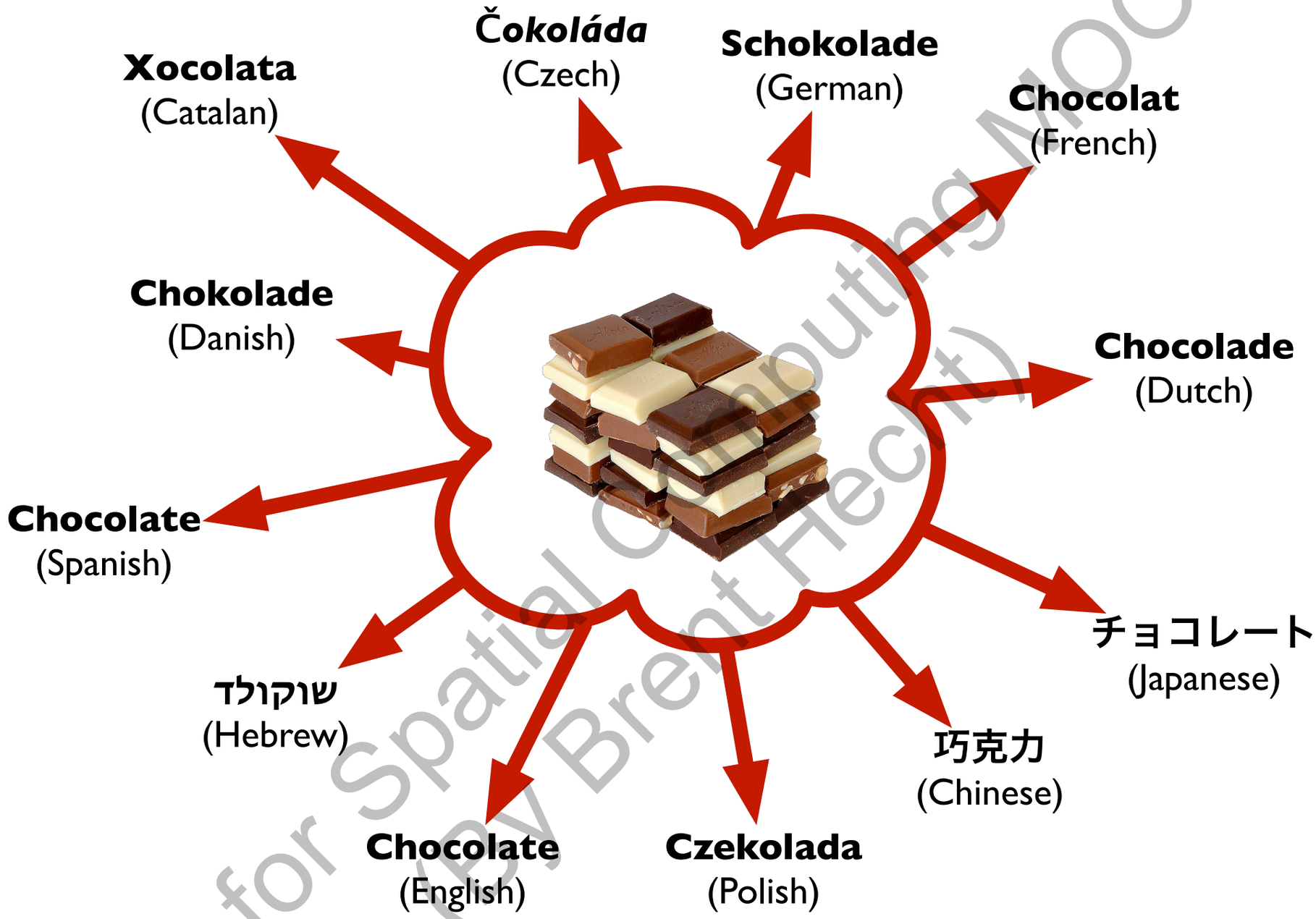
VGI reflects the culture of its contributors

Certain cultural groups produce far more VGI than others

VGI tends to be focused more on certain cultural groups than on others

Slides for Spatial Computing MOOC (By Brent Hecht)


Slides for Spatial Computing MOOC
(By Brent Hecht)



Concept = Chocolate

Slides for Spatial Computing MOOC (By Brent Hecht)

Chocolate – Wikipedia, th...
en.wikipedia.org/wiki/Chocolate
Google

WIKIPEDIA
The Free Encyclopedia

Main page
Contents
Featured content
Current events
Random article
Donate to Wikipedia
Wikimedia Shop

Interaction
Help
About Wikipedia
Community portal
Recent changes
Contact page

Tools
What links here
Related changes
Upload file
Special pages
Permanent link
Page information
Wikidata item
Cite this page

Print/export
Create a book
Download as PDF

Chocolate

From Wikipedia, the free encyclopedia

For other uses, see Chocolate (disambiguation).

Chocolate /ˈtʃɒk(ə)lət/ is a typically sweet, usually brown, food preparation of *Theobroma cacao* seeds, roasted and ground, often flavored, as with vanilla. It is made in the form of a liquid, paste or in a block or used as a flavoring ingredient in other sweet foods. Cacao has been cultivated by many cultures for at least three millennia in Mexico and Central America. The earliest evidence of use traces to the Mokaya, with evidence of chocolate beverages dating back to 1900 BC.[1] In fact, the majority of Mesoamerican people made chocolate beverages, including the Mayans and Aztecs,[2] who made it into a beverage known as *xocolātl* [ʃoˈkolaːtɬ], a Nahuatl word meaning "bitter water". The seeds of the cacao tree have an intense bitter taste and must be fermented to develop the flavor.

After fermentation, the beans are dried, cleaned, and roasted. The shell is removed to produce cacao nibs, which are then ground to cocoa mass, pure chocolate in rough form. Because the cocoa mass is usually liquefied before being molded with or without other ingredients, it is called chocolate liquor. The liquor also may be processed into two components: cocoa solids and cocoa butter. Unsweetened baking chocolate (bitter chocolate) contains primarily cocoa solids and cocoa butter in varying proportions. Much of the chocolate consumed today is in the form of sweet chocolate, a combination of cocoa solids, cocoa butter or other fat, and sugar. Milk chocolate is sweet chocolate that additionally contains milk powder or condensed milk. White chocolate contains cocoa butter, sugar, and milk but no cocoa solids.

Cocoa solids are one of the richest sources of flavanol antioxidants.[3] They also contain

Chocolate

Chocolate most commonly comes in dark, milk, and white varieties, with cocoa solids contributing to the brown color

Main ingredients	Chocolate liquor

Cookbook:Chocolate Chocolate

Slides for Spatial Computing MOOC (By Brent Hecht)

Chocolate – Wikipedia, la ...
es.wikipedia.org/wiki/Chocolate
Google

WIKIPEDIA
La enciclopedia libre

Portada
Portal de la comunidad
Actualidad
Cambios recientes
Páginas nuevas
Página aleatoria
Ayuda
Donaciones
Notificar un error

Imprimir/exportar
Crear un libro
Descargar como PDF
Versión para imprimir

Herramientas
Lo que enlaza aquí
Cambios en enlazadas
Subir un archivo
Páginas especiales
Enlace permanente
Información de la página
Elemento de Wikidata
Citar este artículo

Otros proyectos
Commons

Chocolate

Para otros usos de este término, véase Chocolate (desambiguación).

El **chocolate** (en náhuatl: *xocolatl*)[?] es el alimento que se obtiene mezclando azúcar con dos productos derivados de la manipulación de las semillas del cacao: la *pasta de cacao* y la *manteca de cacao*.[1] A partir de esta combinación básica, se elaboran los distintos tipos de chocolate, que dependen de la proporción entre estos elementos y de su mezcla, o no, con otros productos tales como leche y frutos secos.

Índice [ocultar]

1 Historia del chocolate
1.1 Origen
1.2 De América a Europa
1.3 El siglo XVII, la expansión por Europa
1.4 El siglo XVIII
1.5 El chocolate en el siglo XIX
2 Etimología
3 Elaboración del chocolate
4 Mezclas de cacao
5 Tipos de chocolate
5.1 Chocolate en tableta
5.1.1 Chocolate negro
5.1.2 Chocolate de cobertura
5.1.3 Chocolate a la taza
5.1.4 Chocolate con leche
5.1.5 Chocolate blanco
5.1.6 Chocolate relleno

El chocolate comúnmente viene en tres variedades: negro, blanco y con leche, con el cacao en polvo contribuyendo a su coloración marrón.

Slides for Spatial Computing MOOC (By Brent Hecht)

巧克力 - 维基百科，自由的...
zh.wikipedia.org/wiki/巧克力
Google
创建账户 登录
条目 讨论 不转换 汉 漢 阅读 编辑 查看历史 搜索
空气污染，岂止雾霾这么简单吗？请关注本期《维基人》，带你了解空气污染到底是个什么东东。 [关闭]

巧克力 [编辑]

本文介绍的是一种以可可为主料固体食品。

- 關於一种饮料，詳見「热巧克力」。
- 關於2012年台灣電視劇之一的節目主題與人物角色，詳見「愛上巧克力」。
- 關於台灣模特兒及電視藝人，詳見「賴亭君」。

本条目需要补充更多来源。 *(2011年3月2日)*
请协助添加多方面可靠来源以改善这篇条目，无法查证的内容可能會被提出异议而移除。

巧克力（英语：**chocolate**，粵港澳譯為「朱古力」）来自中南美洲巧克力的鼻祖是"xocolatl"意為苦水的意思，是以可可做为主料的一种混合型食品。主要原料可可豆，产于赤道南北緯線18度以内狭长地带。

巧克力含有豐富的鎂、鉀和維他命A以及可可鹼，因而具有高能值。巧克力對多種動物有毒。但對人類來說，可可鹼是一種健康的反鎮靜成分。故食用巧克力有提升精神，增強興奮等功效。可可含有苯乙胺，坊间流传能使人有戀愛感覺的流言[1]。

巧克力由可可豆加工而成，主要有效成分是高脂肪的可可脂与低脂肪的可可块。可可碱主要存在于可可块中。

巧克力

目录 [隐藏]

1 历史
2 制作
3 种类
  3.1 依成份分类
  3.2 依添加物分类
4 健康功效
  4.1 循環系統
  4.2 抗氧化

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Шоколад — Википедия

ru.wikipedia.org/wiki/Шоколад

Google

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ВикипедиЯ
Свободная энциклопедия

Статья Обсуждение Читать Править Править вики-текст История Поиск

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Указатель А — Я
Избранные статьи
Случайная статья
Текущие события

Участие
Сообщить об ошибке
Портал сообщества
Форум
Свежие правки
Новые страницы
Справка
Пожертвования

Печать/экспорт
Создать книгу
Скачать как PDF
Версия для печати

Инструменты
Ссылки сюда
Связанные правки
Спецстраницы
Постоянная ссылка
Сведения о странице

Шоколад

Материал из Википедии — свободной энциклопедии

[править | править вики-текст]

У этого термина существуют и другие значения, см. Шоколад (значения).

Шокола́д — кондитерское изделие на основе масла какао, которое является продуктом переработки какао-бобов — семян шоколадного дерева, богатых теобромином и кофеином.

Шоколадные изделия часто содержат ароматические добавки (кофе, спирт, коньяк, ванилин, перец), пищевые добавки (изюм, орехи, вафли, цукаты) или начинку.

Плиточный шоколад

Содержание [убрать]

1 История
2 Изготовление шоколада
  2.1 Исходное сырьё
  2.2 Полуфабрикаты
3 Состав
4 Виды шоколада
5 Продукты из шоколада
6 Влияние на здоровье человека
7 В культуре
8 Примечания
9 Ссылки

История [править | править вики-текст]

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Schokolade – Wikipedia

de.wikipedia.org/wiki/Schokolade

Google

Benutzerkonto erstellen Anmelden

WIKIPEDIA
Die freie Enzyklopädie

Artikel Diskussion Lesen Quelltext anzeigen Versionsgeschichte Suchen

Hauptseite
Themenportale
Von A bis Z
Zufälliger Artikel

Mitmachen
Artikel verbessern
Neuen Artikel anlegen
Autorenportal
Hilfe
Letzte Änderungen
Kontakt
Spenden

Drucken/exportieren
Buch erstellen
Als PDF herunterladen
Druckversion

Werkzeuge
Links auf diese Seite
Änderungen an verlinkten Seiten
Spezialseiten
Permanenter Link
Seiteninformationen
Wikidata-Datenobjekt
Seite zitieren

Schokolade

Schokolade ist ein Lebens- und Genussmittel, dessen wesentliche Bestandteile Kakaoerzeugnisse und Zuckerarten, im Falle von Milchschokolade auch Milcherzeugnisse sind. Schokolade wird in reiner Form genossen und als Halbfertigprodukt weiterverarbeitet. Das Wort leitet sich vom Namen des ersten kakaohaltigen Getränks ab, dem *xocóatl* oder *xocólatl* [ʃokola:tɬ] (Nahuatl: *xócoc* ‚bitter', *atl* ‚Wasser'; also ‚bitteres Wasser' oder ‚Kakaowasser') der Azteken in Mexiko. Dabei handelte es sich um eine Mischung aus Wasser, Kakao, Vanille und Cayennepfeffer.

Inhaltsverzeichnis [Verbergen]

1 Geschichte
2 Entstehung des Namens
3 Herstellung
3.1 Herstellung von Schokolade
3.2 Temperieren (Vorkristallisieren) von Schokolade
3.2.1 Temperierungsverfahren
3.2.2 Temperiergrad
3.2.3 Eintafeln
3.2.4 Herstellung von gefüllter Schokolade
4 Schokoladensorten
5 Produkte aus Schokolade und Kuvertüre
6 Trinkschokolade
7 Schokolade und Gesundheit
7.1 Inhaltsstoffe
7.2 Ernährungsphysiologie und negative Auswirkungen
7.3 Positive Wirkungen
7.4 Blutdrucksenkende Wirkung
7.5 Legenden und Irrtümer

Verschiedene Schokoladensorten, von unten nach oben sortiert in bitter, zartbitter, Vollmilchschokolade, Karamellschokolade und weiße Schokolade

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Roggenmarkt (Münster)
(German)

Single-language concept

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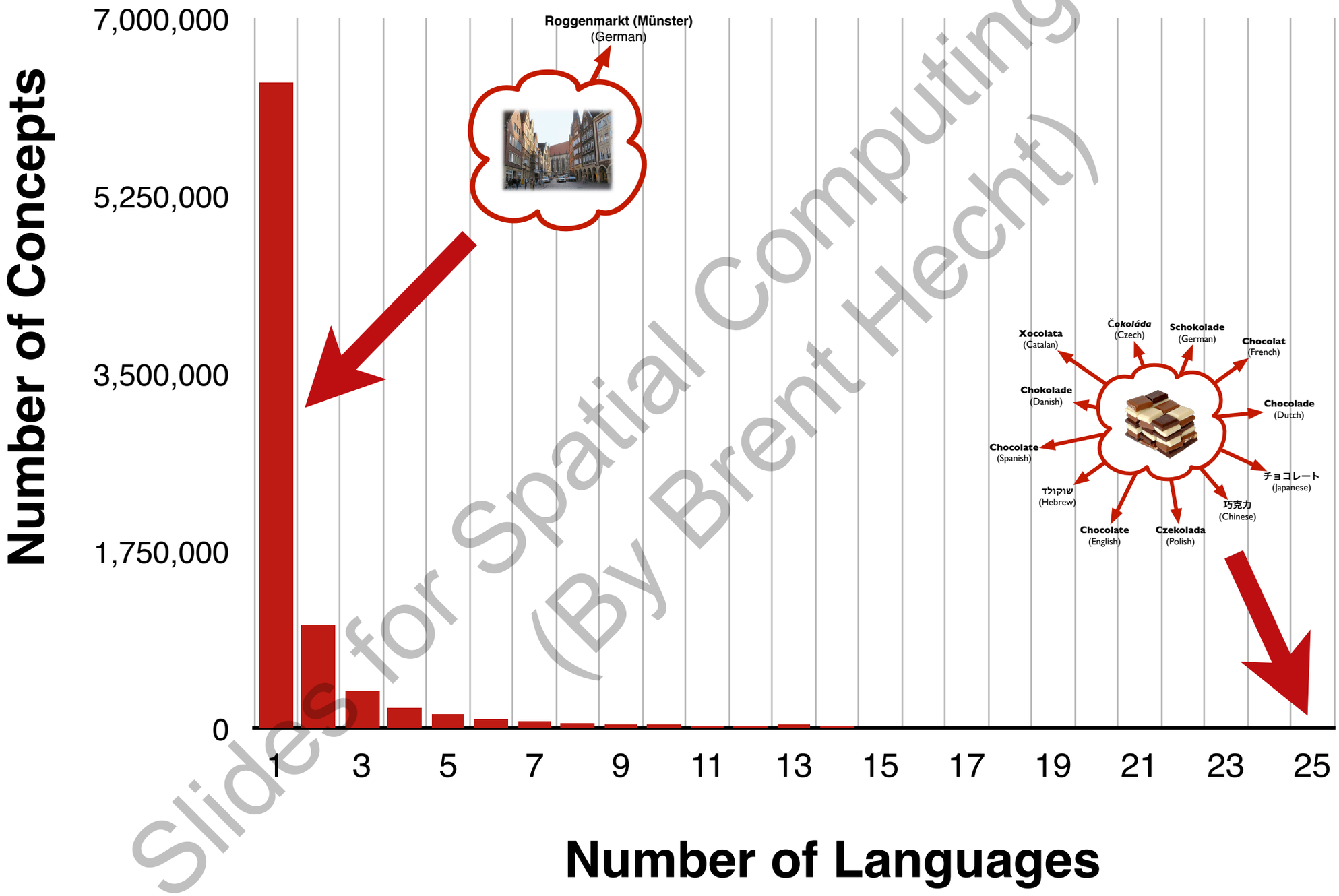
Distribution of Languages Per Concept



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Hillbilly Jedi
(English)

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(By Brent Seales)

Festival Internacional Chihuahua
(Spanish)

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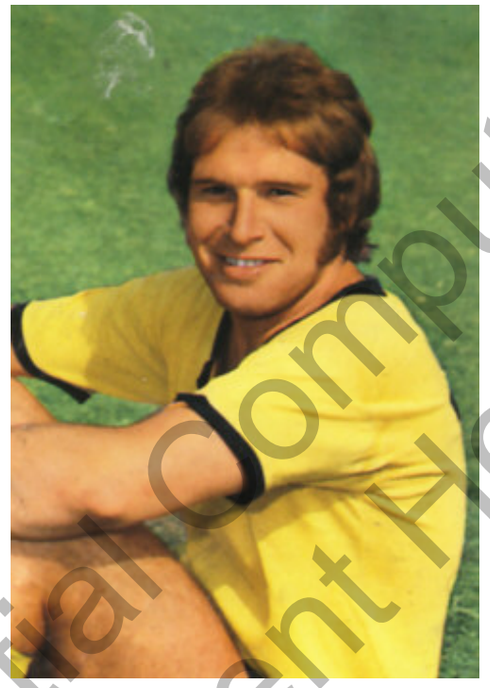
http://es.wikipedia.org/wiki/Archivo:Creel_Chihuahua_Mexico.jpg



Dieter Mietz
(German)

Slides for Spatial Computing MOOC
(By Brent Hecht)

Dieter Groß
(German)

Slides for Spatial Computing MOOC
(By Brent Hecht)

Dieter Klumpp
(German)

Slides for Spatial Computing MOOC
(By Brent Hecht)

.....and.....

762

more Dieters

Slides for Spatial Computing MOOC
(by Brent Hecht)

Indegree Sum

Polish Wikipedia

- 7 - 285,662
- 285,663 - 571,318
- 571,319 - 856,973
- 856,974 - 1,142,629
- 1,142,630 - 1,428,284

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Indegree Sum

Polish Wikipedia

- 7 - 285,662
- 285,663 - 571,318
- 571,319 - 856,973
- 856,974 - 1,142,629
- 1,142,630 - 1,428,284

Slides for Spatial Computing MOOC
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Indegree Sum

Russian Wikipedia

- 9 - 317,115
- 317,116 - 634,221
- 634,222 - 951,326
- 951,327 - 1,268,432
- 1,268,433 - 1,585,538

Slides for Spatial Computing MOOC
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Indegree Sum

English Wikipedia

- 56 - 1,397,105
- 1,397,106 - 2,794,154
- 2,794,155 - 4,191,202
- 4,191,203 - 5,588,251
- 5,588,252 - 6,985,300

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Indegree Sum

Japanese Wikipedia

- 10 - 629,319
- 629,320 - 1,258,628
- 1,258,629 - 1,887,936
- 1,887,937 - 2,517,245
- 2,517,246 - 3,146,554

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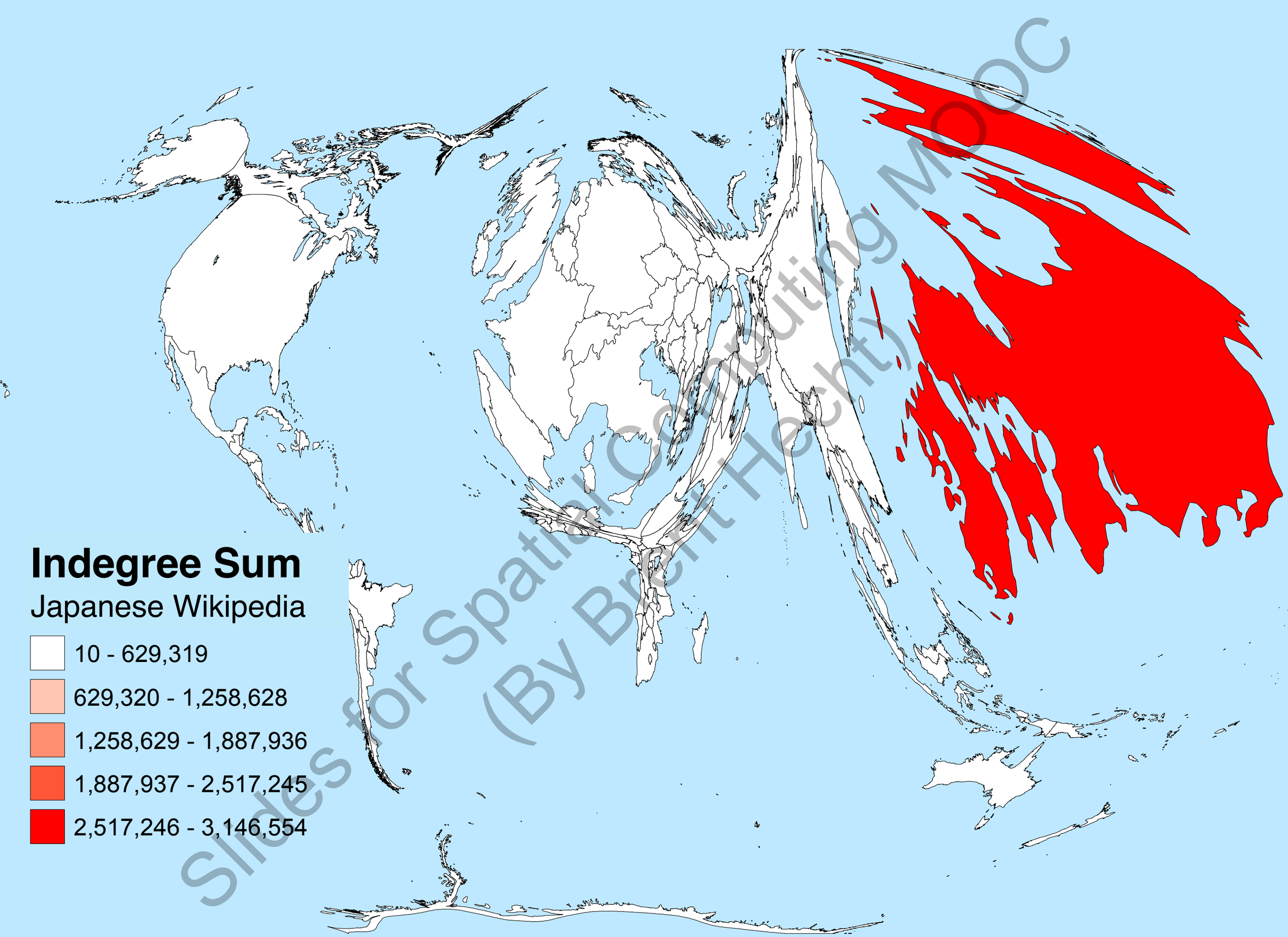

Slides for Spatial Computing MOOC
(By Brent Hecht)

Indegree Sum

English Wikipedia

- 26 - 162,558
- 162,559 - 325,090
- 325,091 - 487,622
- 487,623 - 650,154
- 650,155 - 812,686

Slides for Spatial Computing MOOC
(By Brent Hecht)

Indegree Sum

French Wikipedia

- 0 - 23,971
- 23,972 - 47,943
- 47,944 - 71,914
- 71,915 - 95,886
- 95,887 - 119,857

Slides for Spatial Computing MOOC
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Indegree Sum

English Wikipedia

- 26 - 162,558
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- 487,623 - 650,154
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Indegree Sum

French Wikipedia

- 0 - 23,971
- 23,972 - 47,943
- 47,944 - 71,914
- 71,915 - 95,886
- 95,887 - 119,857

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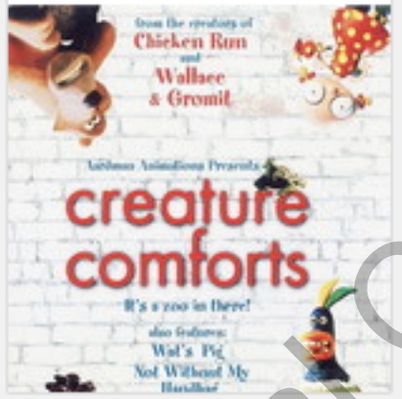
2006 R 105 min

Cinderella Man
2005 PG-13 144 min

Creature Comforts
1989 5 min

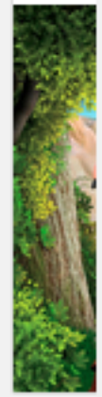


In America
2002 NR 105 min

Secret Window
2004 PG-13 96 min

The Great Escape
1963 NR 172 min

Tang
2010



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2014 PG 83 min

And So It Goes
2014 PG-13

Boyhood
2014 R 164 min

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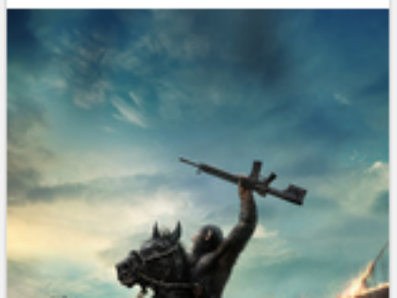
2014 PG-13 130 min



The Strange Little C
2014 72 min

The Young and Proc
2014 105 min

Me
2014

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(Lam et al. 2011)

Slides for Spatial Computing MOOC (By Brent Hecht)

Slides for Spatial Computing MOOC
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Stephen Harper - Wikiped...

en.wikipedia.org/wiki/Stephen_Harper

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Stephen Harper

From Wikipedia, the free encyclopedia

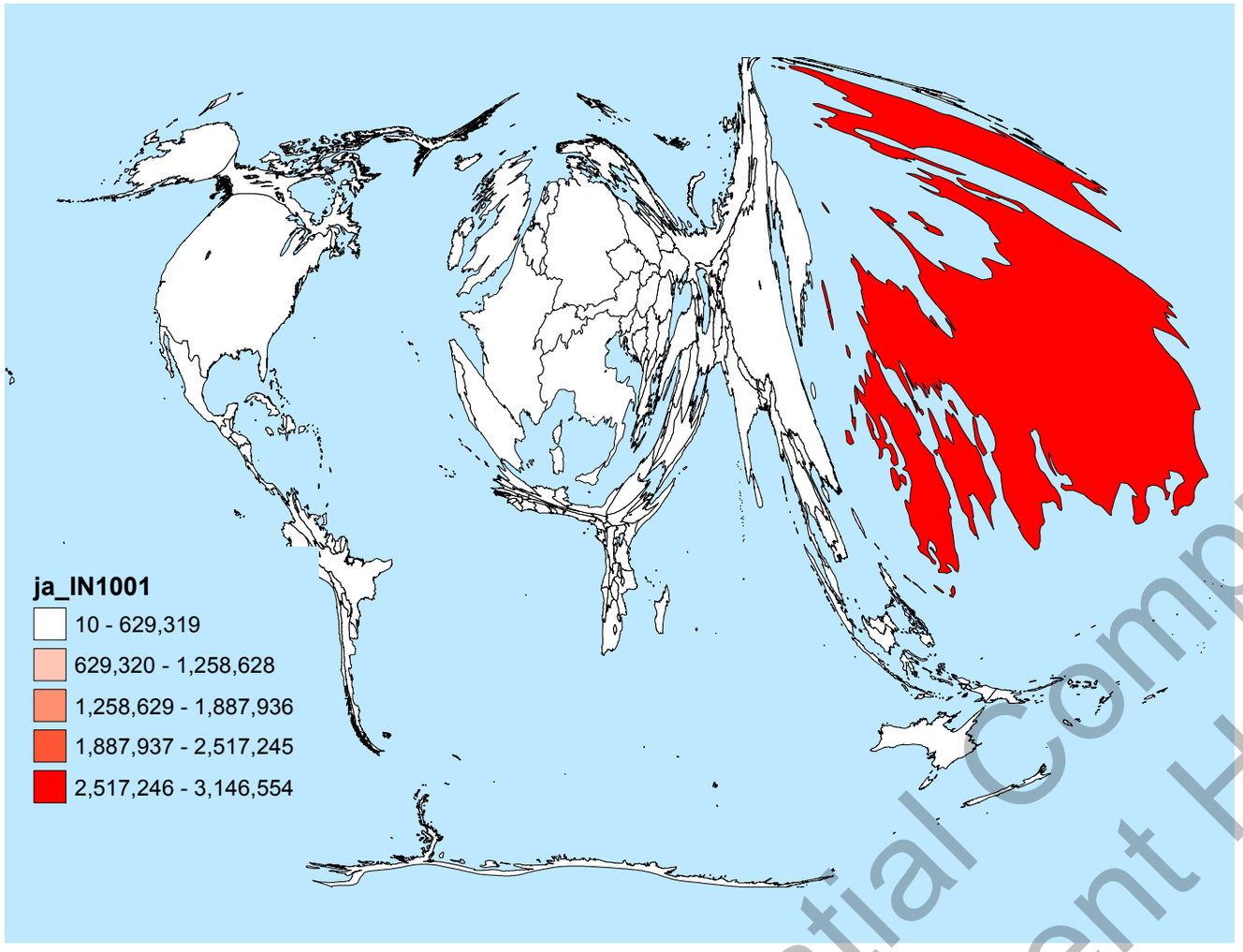
For other people named Stephen Harper, see Stephen Harper (disambiguation).

See also: Premiership of Stephen Harper

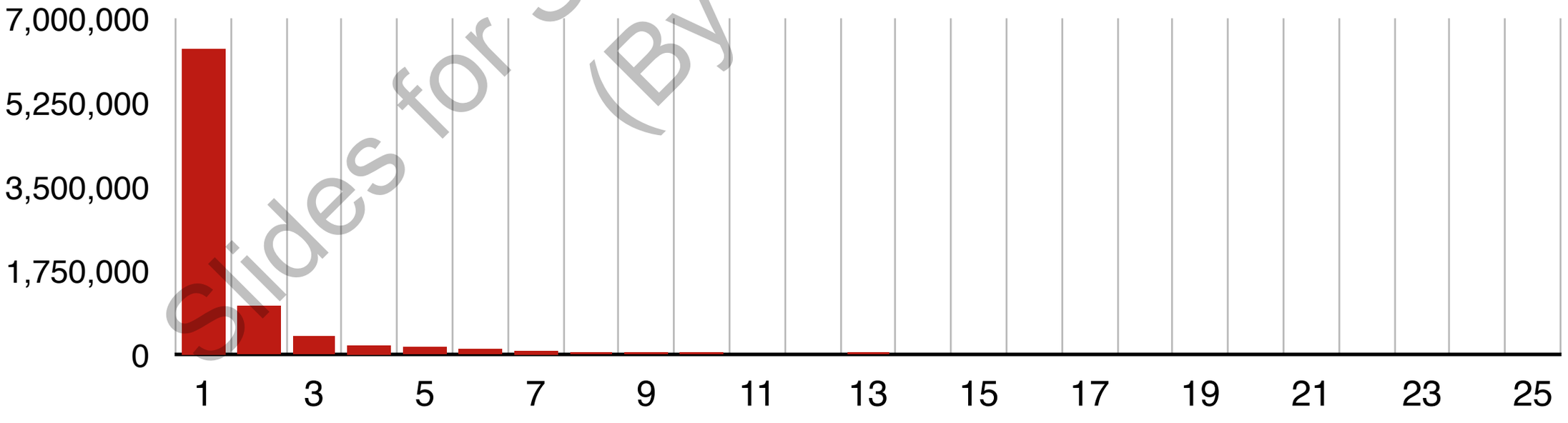
Stephen Joseph Harper (born April 30, 1959) is a Canadian politician who is the 22nd and current Prime Minister of Canada and the ~~leader of the Conservative Party~~ Harper became prime minister in 2006, forming a minority government after the 2006 election. He is the first prime minister to come from the newly reconstituted Conservative Party, which formed after a merger of the Progressive Conservative Party and the Canadian Alliance.

Harper has been the Member of Parliament (MP) for the riding of Calgary Southwest in

The Right Honourable
Stephen Harper
PC MP



Hillbilly Jedi
(English)



Slides for Spatial Computing MOOC
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Volunteered Geographic Information

😊 PROS 😊

Very large data sets*

* in important special cases

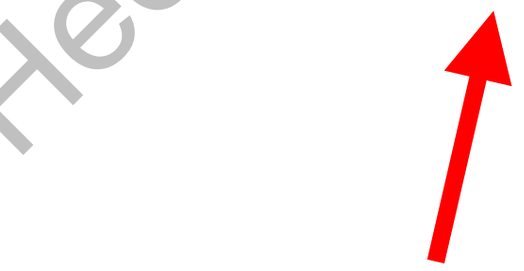
Often easily downloadable and usable*

* subject to API limitations

Unprecedented source of “platial” info

😣 CONS 😣

Coverage biases



for both **peer production VGI** and **social media VGI**

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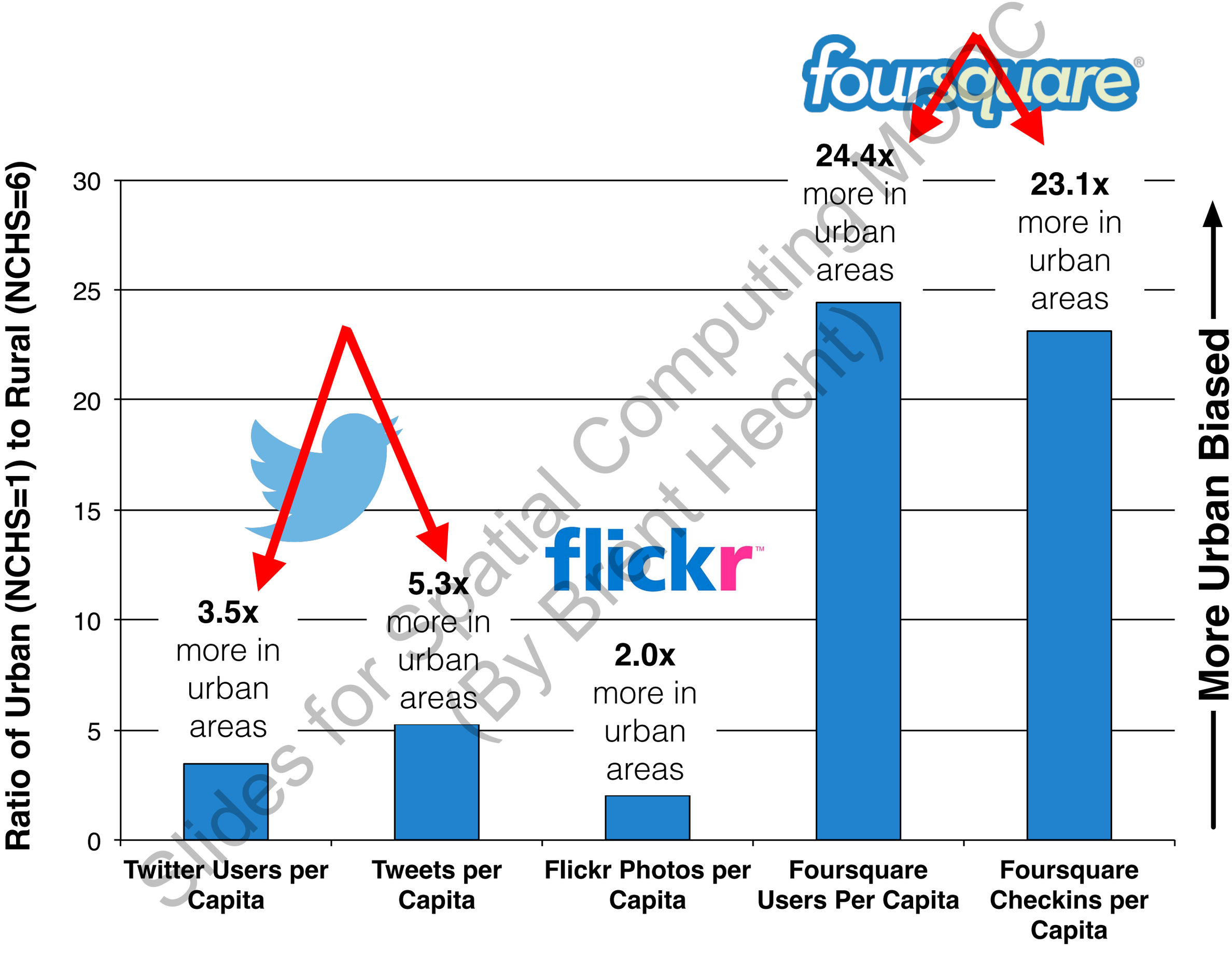

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University of MN Cool Spo...

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Pinterest

Brent

University of MN Cool Spots

THIS BOARD IS SECRET.

7 Pins

Brent H

Edit Board

Add a place

from Foursquare

Punch Neapolitan Pizza

Punch Neapolitan Pizza in Minneapolis, MN

Pinned from
foursquare.com

from Foursquare

Bun Mi Sandwiches

About this map

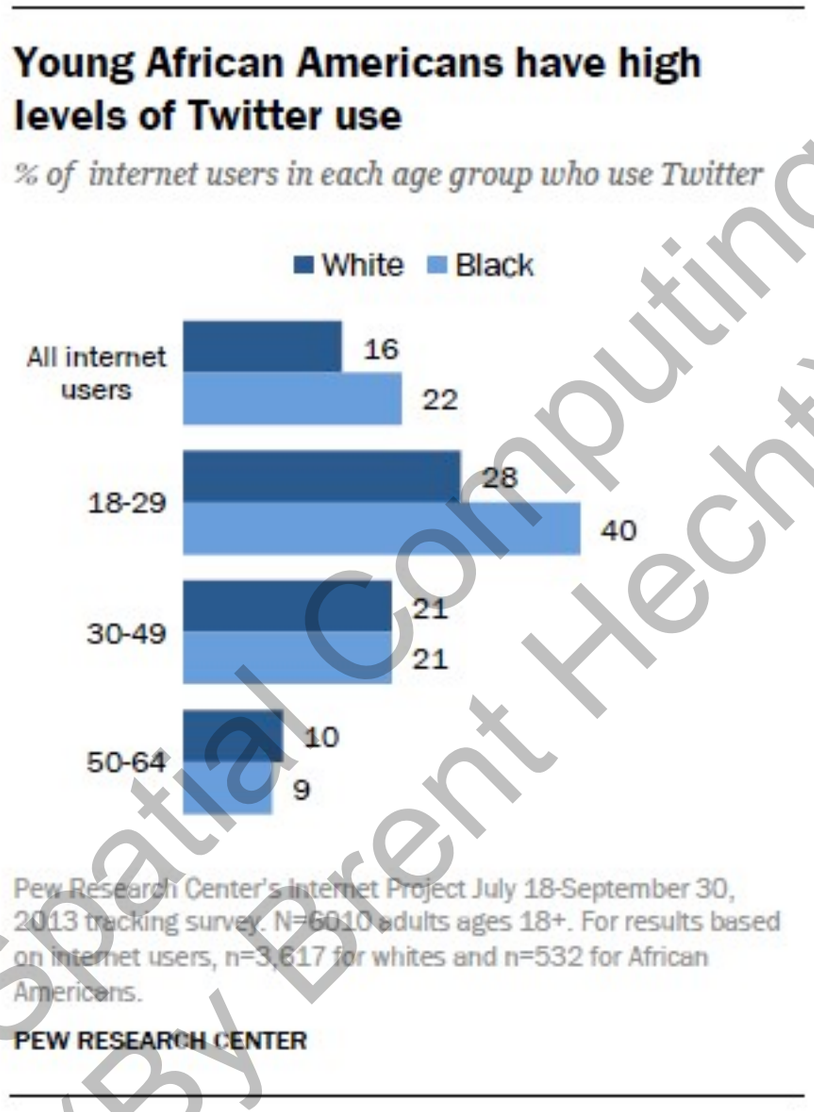
Slides © Spatial Computing MOOC (by Brent Hecht)

(Chang et al. 2014)

see paper for details about pin categories and gender preferences

Slides for Spatial Computing MOOC
by Brent Hecht

foursquare



http://www.**pewinternet.org**/2014/01/06/african-americans-and-technology-use/

Slides for Spatial Computing MOOC (By Brent Hecht)

VGI is neither an **objective** nor **complete** description of areas of interest!

Slides for Spatial Computing MOOC
(By Brent Hecht)

Volunteered Geographic Information

😊 PROS 😊

Very large data sets*

* in important special cases

Often easily downloadable and usable*

* subject to API limitations

Unprecedented source of “platial” info

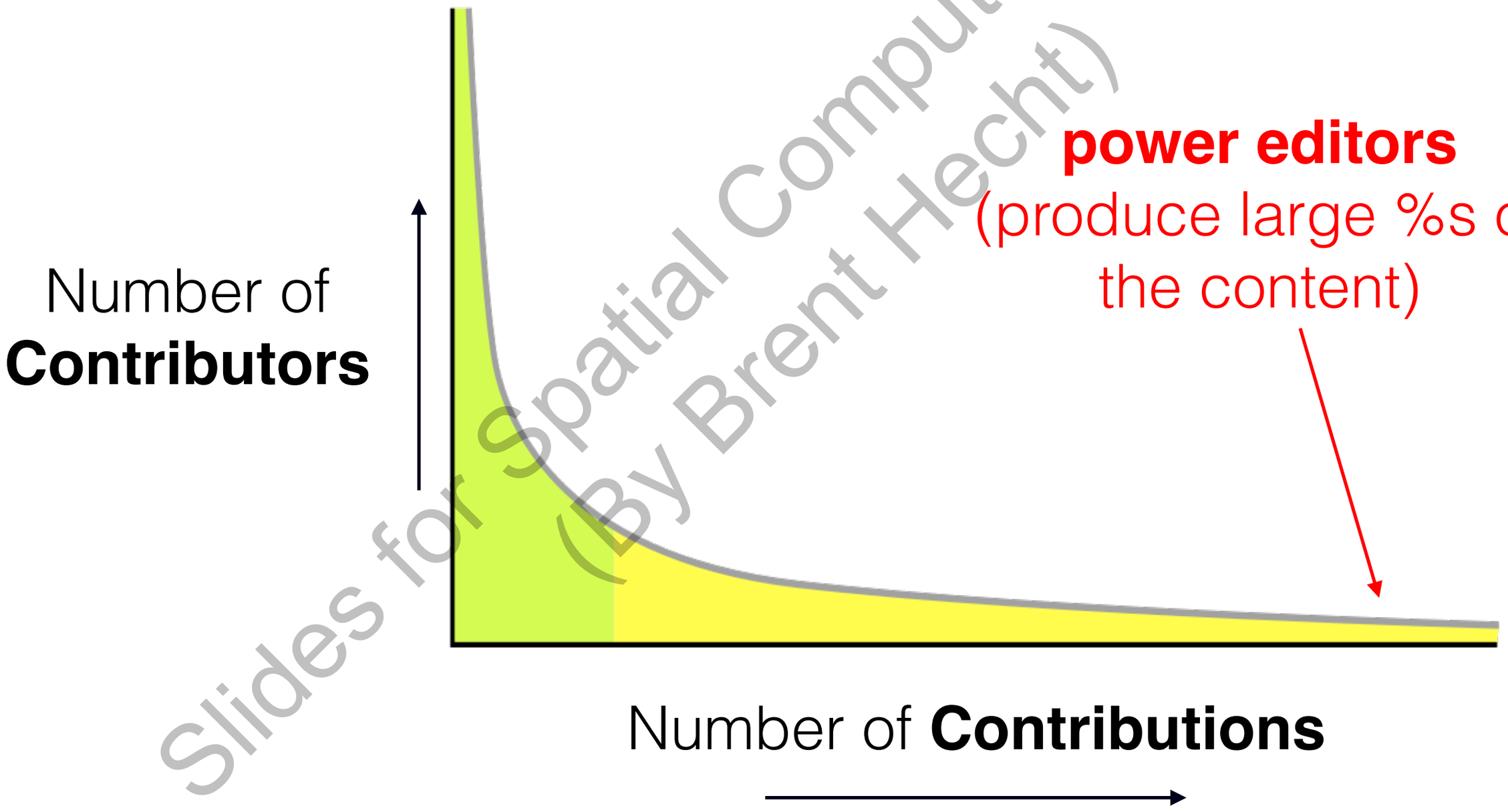
😣 CONS 😣

Coverage biases

Not all voices are equal

Slides for Spatial Computing MOOC (By Brent Hecht)

Long tail contribution patterns in online communities:



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% of viewed words written by **top 10%** of editors

% of viewed words written by **top 0.1%** of editors

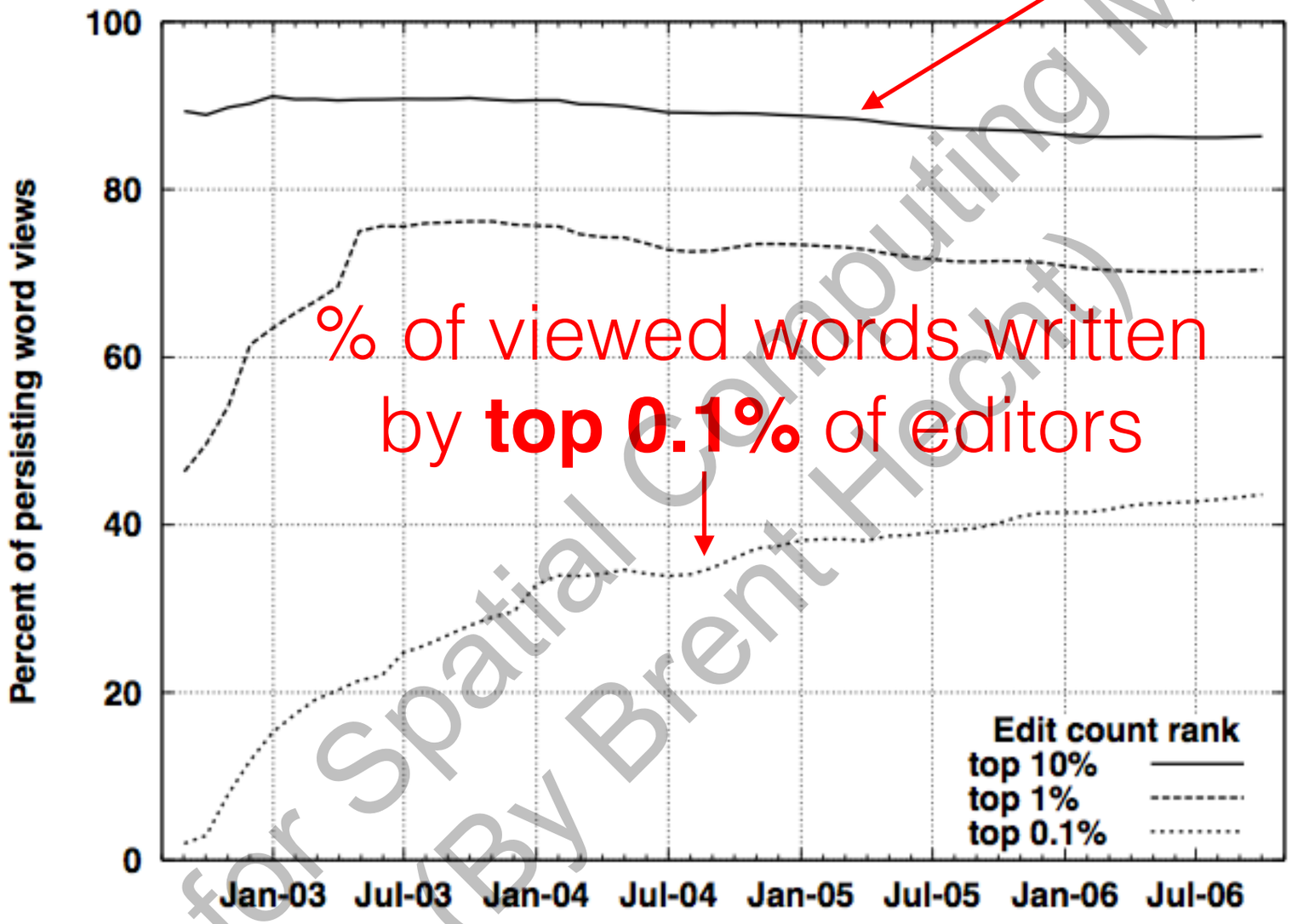

Figure 4: PWV contributions of elite editors.

(Priedhorsky et al. 2007)

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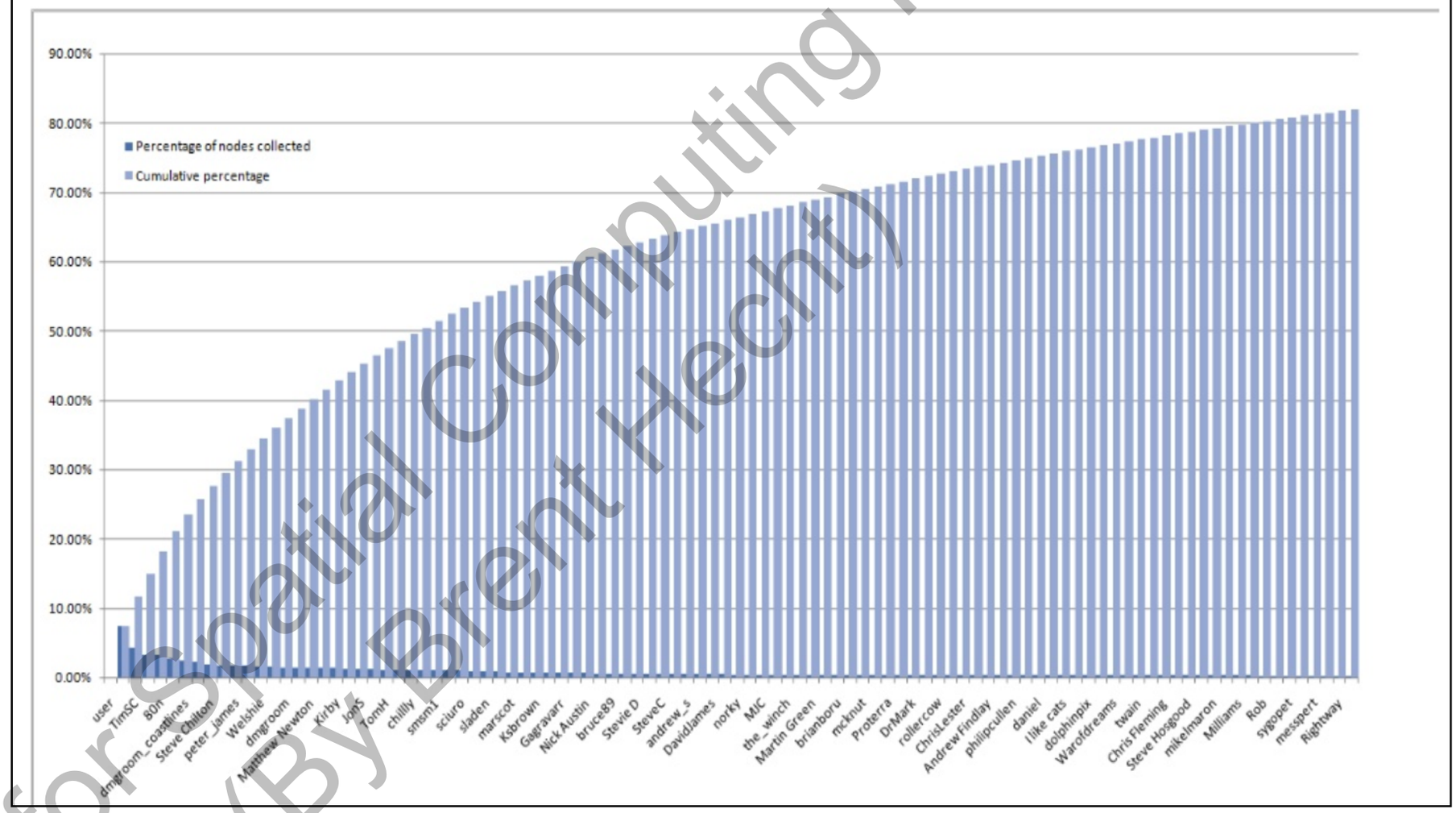
OSM contribution in the UK to 2008



Dr. Muki Haklay
Professor of Geographic Information Science
Dept. of Civil, Environ. and Geomatic Eng.
University College London

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(By Brent Hecht)

WE ARE THE
99%

EXCHANGE ST
ENTRANCE
AUBURN
PUBLIC THEA
Farmers' Marke
Books
Not
Bombs
The Little Guys
are
1% Bigger 99%
than you think

Volunteered Geographic Information

😊 PROS 😊

Very large data sets*

* in important special cases

Often easily downloadable and usable*

* subject to API limitations

Unprecedented source of “platial” info

😣 CONS 😣

Coverage biases

Not all voices are equal

Can be slightly less accurate*

* although in most cases, it’s more than good enough

Slides for Spatial Computing MOOC (By Brent Hecht)

Slides for Computing MOOC
(By Brent Hecht)

Dr. Hecht says you're (mostly) wrong!

Slides for Spatial Computing MOOC
(By Bright Hecht)

Encyclopedia Britannica	**English Wikipedia**
4 serious errors	4 serious errors
123 factual errors, omissions, and misleading statements	162 factual errors, omissions, and misleading statements

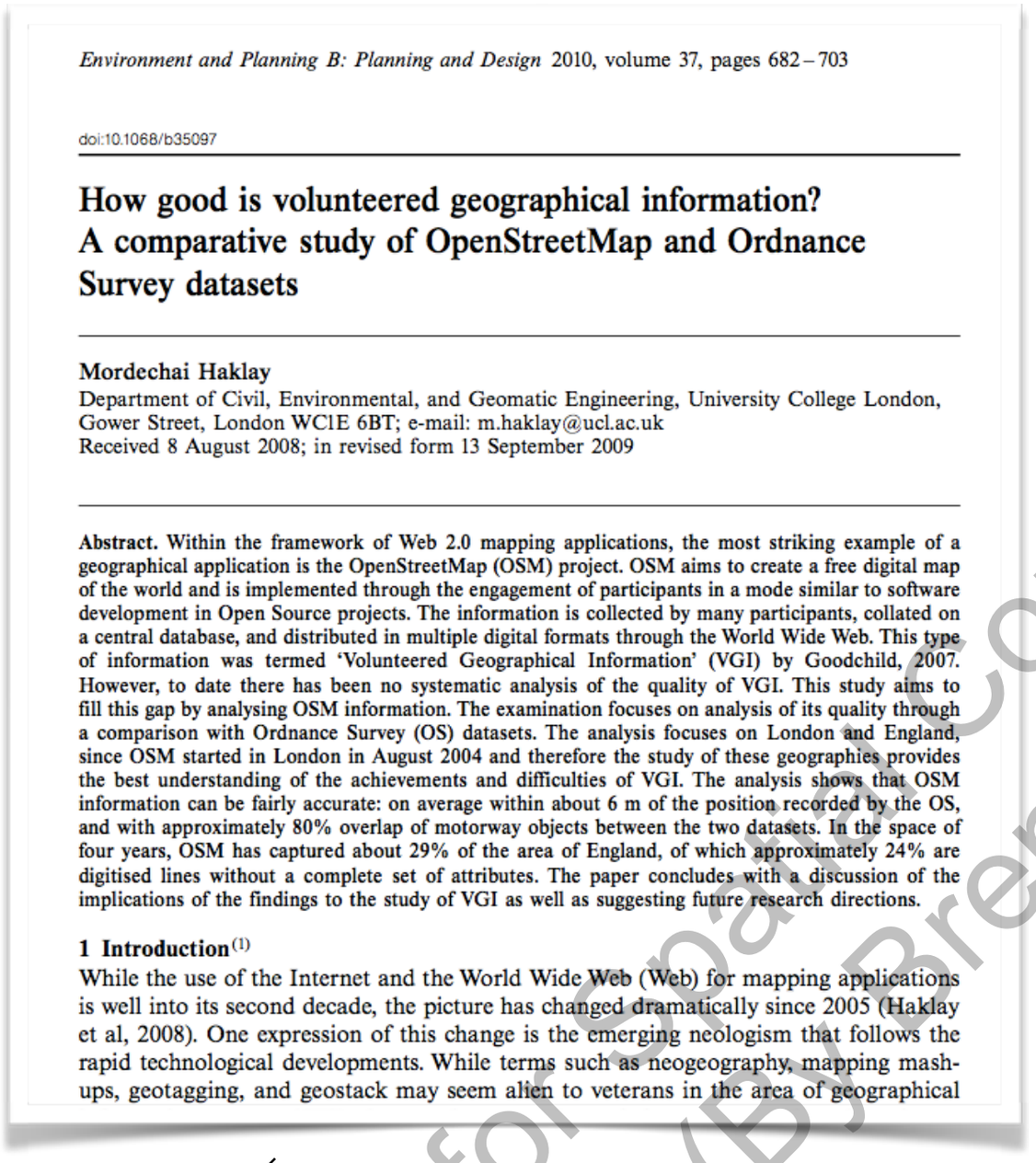
(Giles 2005)

Slides for Spatial Computing MOOC (By Brent Hecht)

“ The quality of information on depression and schizophrenia on Wikipedia is generally as good as, or better than, that provided by centrally controlled websites, Encyclopaedia Britannica and a psychiatry textbook.”

(Reavley et al. 2012)

Slides for Spatial Computing MOOC (By Brent Hecht)



Environment and Planning B: Planning and Design 2010, volume 37, pages 682 – 703

doi:10.1068/b35097

How good is volunteered geographical information? A comparative study of OpenStreetMap and Ordnance Survey datasets

Mordechai Haklay
Department of Civil, Environmental, and Geomatic Engineering, University College London, Gower Street, London WC1E 6BT; e-mail: m.haklay@ucl.ac.uk
Received 8 August 2008; in revised form 13 September 2009

Abstract. Within the framework of Web 2.0 mapping applications, the most striking example of a geographical application is the OpenStreetMap (OSM) project. OSM aims to create a free digital map of the world and is implemented through the engagement of participants in a mode similar to software development in Open Source projects. The information is collected by many participants, collated on a central database, and distributed in multiple digital formats through the World Wide Web. This type of information was termed 'Volunteered Geographical Information' (VGI) by Goodchild, 2007. However, to date there has been no systematic analysis of the quality of VGI. This study aims to fill this gap by analysing OSM information. The examination focuses on analysis of its quality through a comparison with Ordnance Survey (OS) datasets. The analysis focuses on London and England, since OSM started in London in August 2004 and therefore the study of these geographies provides the best understanding of the achievements and difficulties of VGI. The analysis shows that OSM information can be fairly accurate: on average within about 6 m of the position recorded by the OS, and with approximately 80% overlap of motorway objects between the two datasets. In the space of four years, OSM has captured about 29% of the area of England, of which approximately 24% are digitised lines without a complete set of attributes. The paper concludes with a discussion of the implications of the findings to the study of VGI as well as suggesting future research directions.

1 Introduction[(1)]

While the use of the Internet and the World Wide Web (Web) for mapping applications is well into its second decade, the picture has changed dramatically since 2005 (Haklay et al, 2008). One expression of this change is the emerging neologism that follows the rapid technological developments. While terms such as neogeography, mapping mash-ups, geotagging, and geostack may seem alien to veterans in the area of geographical

OSM is comparable to Ordnance Survey (OS) data (in many places)

(Haklay 2010)

Dr. Muki Haklay
Professor of Geographic Information Science
Dept. of Civil, Environ. and Geomatic Eng.
University College London

Slides for Spatial Computing MOOC (By Brent Hecht)

W Chocolate - Wikipedia, la ...

es.wikipedia.org/wiki/Chocolate

Google

Crear una cuenta Acceder

WIKIPEDIA
La enciclopedia libre

Artículo Discusión Leer Editar Ver historial Buscar

Chocolate

Para otros usos de este término, véase Chocolate (desambiguación).

El **chocolate** (en náhuatl: *xocolatl*)[?] es el alimento que se obtiene mezclando azúcar con dos productos derivados de la manipulación de las semillas del cacao: la *pasta de cacao* y la *manteca de cacao*.[1] A partir de esta combinación básica, se elaboran los distintos tipos de chocolate, que dependen de la proporción entre estos elementos y de su mezcla, o no, con otros productos tales como leche y frutos secos.

Índice [ocultar]

1 Historia del chocolate
- 1.1 Origen
- 1.2 De América a Europa
- 1.3 El siglo XVII, la expansión por Europa
- 1.4 El siglo XVIII
- 1.5 El chocolate en el siglo XIX

2 Etimología
3 Elaboración del chocolate
4 Mezclas de cacao
5 Tipos de chocolate
- 5.1 Chocolate en tableta
  - 5.1.1 Chocolate negro
  - 5.1.2 Chocolate de cobertura
  - 5.1.3 Chocolate a la taza
  - 5.1.4 Chocolate con leche
  - 5.1.5 Chocolate blanco
  - 5.1.6 Chocolate relleno

Portada
Portal de la comunidad
Actualidad
Cambios recientes
Páginas nuevas
Página aleatoria
Ayuda
Donaciones
Notificar un error

Imprimir/exportar
Crear un libro
Descargar como PDF
Versión para imprimir

Herramientas
Lo que enlaza aquí
Cambios en enlazadas
Subir un archivo
Páginas especiales
Enlace permanente
Información de la página
Elemento de Wikidata
Citar este artículo

Otros proyectos
Commons

El chocolate comúnmente viene en tres variedades: negro, blanco y con leche, con el cacao en polvo contribuyendo a su coloración marrón.

← vandalism!

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●●○○○ AT&T 18:41 37%
en.m.wikipedia.org

Logo	

League/conference affiliations

National Football League (1932–present)

- Eastern Division (1933–1949)
- American Conference (1950–1952)
- Eastern Conference (1953–1969)
  - Capitol Division (1967–1969)
- **National Football Conference (1970–present)**
  - **NFC East (1970–present)**

Current uniform

no more vandalism!

Slides for Spatial Computing MOOC (By Brent Hecht)

Volunteered Geographic Information

😊 PROS 😊

Very large data sets*

* in important special cases

Often easily downloadable and usable*

* subject to API limitations

Unprecedented source of “platial” info

😣 CONS 😣

Coverage biases

Not all voices are equal

Can be slightly less* accurate

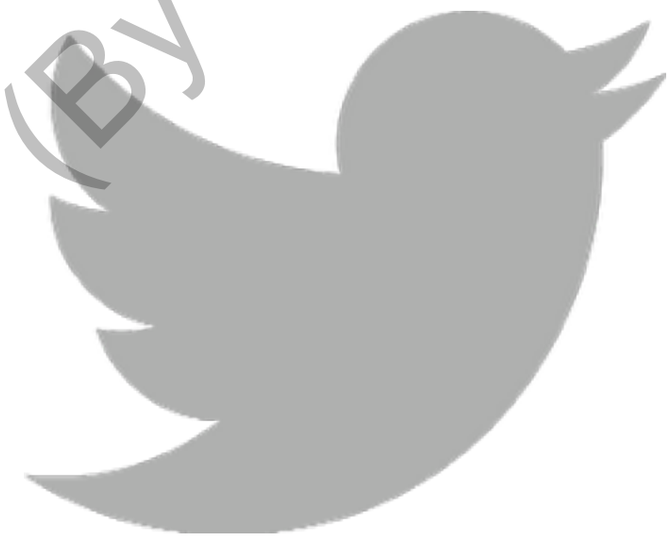
* although in most cases, it’s more than good enough

Slides for Spatial Computing MOOC (By Brent Hecht)

Volunteered Geographic Information

Spatial Computing – University of Minnesota

Slides for Spatial Computing MOOC
(By Brent Hecht)



Volunteered Geographic Information

Spatial Computing – University of Minnesota

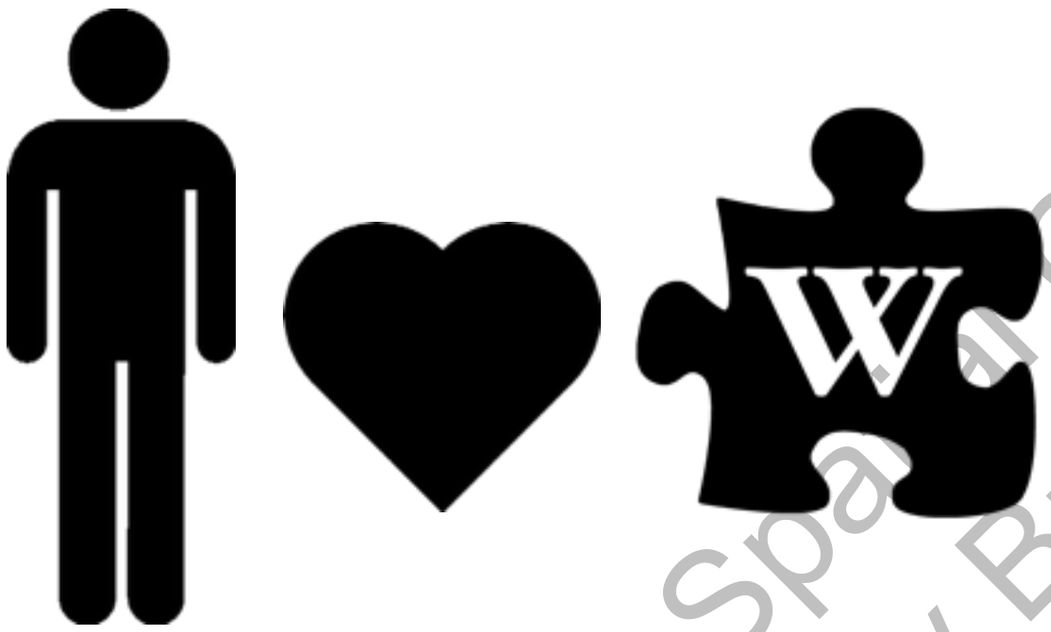
Learning Objectives

1. Know the definition and historical context of volunteered geographic information (VGI)
2. Be able to produce VGI yourself!
3. Understand the socio-technical systems behind VGI.
4. Be qualified to assess the pros and cons of VGI for a given problem context.
5. Technical Track: Be able to use VGI in your apps, websites, and other systems

Slides for Spatial Computing MOOC (By Brent Pritchett)

Slides for Spatial Computing MOOC
(by Brent Hecht)

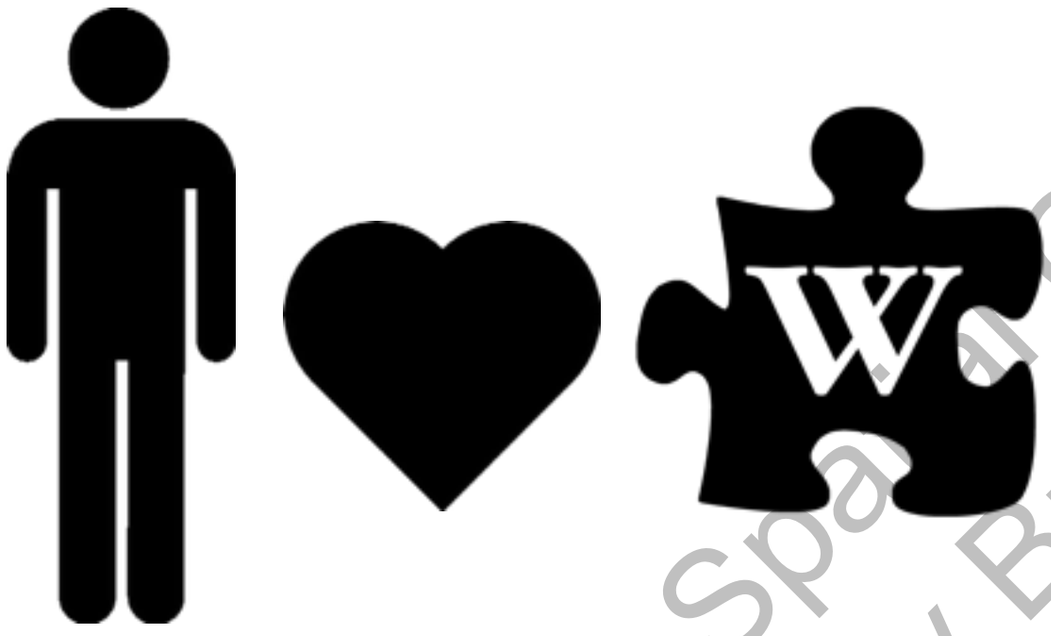
Wikipedia has revolutionized computing in **two** ways...



Hugely popular with

people

Slides for Spa... Computing MOOC
(By Brent Hecht)



Sixth most popular website in the world

[Alexa 4/2014]

WP > WordPress + Twitter + LinkedIn

[DoubleClick 2011]

#1 result for ~50% of searches

[Search Engine Watch 2012]

Slides for Spa... Computing MOOC
(By Brent Hecht)

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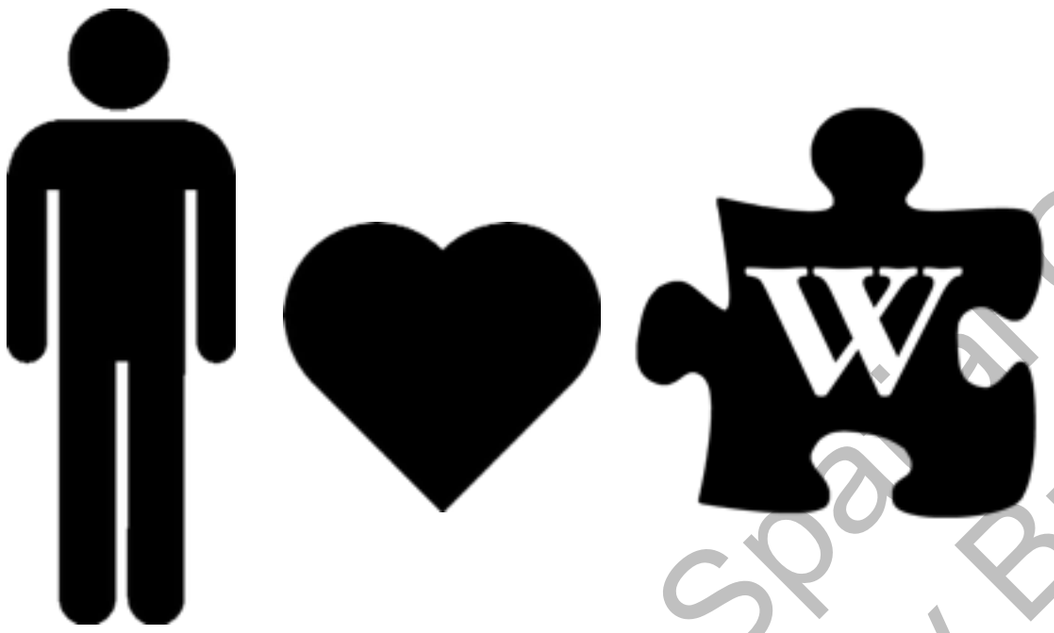
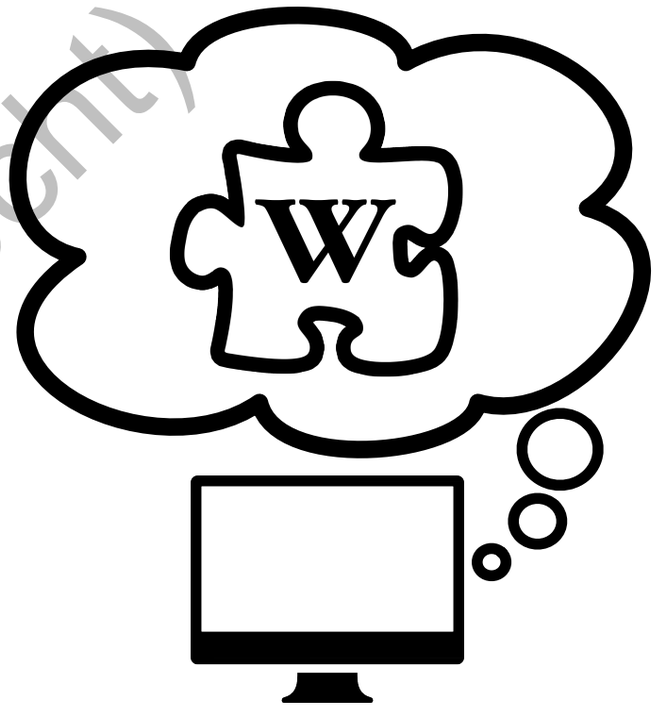


Hugely popular with **people**



BRAINS of modern computing

Slides for Spark Computing MOOC (By Brent Hecht)

WikiBrain: Homepage

shilad.github.io/wikibrain/

Google

WikiBrain

View project onGitHub

Resources related to Shilad's 2014 OpenSym talk:

- Talk slides
- WikiSym 2014 paper
- Source files: Quickstart.java, TranslateConcept.java, SimilarMovies.java, CountryPageViews.java, SimpleToblersEvaluator.java, CategoryViews.java

WikiBrain's busy thinking up its first public release. Please be patient while we fine tune our APIs and complete our documentation. Ask us questions at the WikiBrain google group**!**

http://wikibrainapi.org

velopers to incorporate state-of-the-art

Wikipedia-based algorithms and technologies in a few lines of code.

Slides for Spatial Computing MOOC (By Brent Hecht)

WikiBrain is a collaboration between…

MACALESTER COLLEGE

grouplens

UNIVERSITY OF MINNESOTA

Slides for Spatial Computing MOOC
(By Brent Hecht)

Slides for Spatial Computing MOOC
by Brent Hecht

WikiBrain

Mission: Democratize access to Wikipedia data and state-of-the-art Wikipedia-based algorithms and technologies

Audience: Programmers with Java skills

Focus: Core data structures, artificial intelligence, natural language processing, spatial computing

Design goals: Fast, flexible, easy-to-use, extensible

http://wikibrainapi.org

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