

Web Dynamics

Part 1 - Introduction

1.1 Dimensions of dynamics in the Web

1.2 Application examples

Why Web Dynamics?

From Wikipedia:

*In physics the term **dynamics** customarily refers to the time evolution of physical processes.*

Which aspects of the Web are dynamic?

- **Size:** sites/pages added and deleted all the time

Number of sites on the Web

- 1998: 2,636,000 (IP addresses with HTTP server)
- 1999: 4,662,000
- 2000: 7,128,000, ~40% public, 40% dead
- 2001: 8,443,000
- 2002: 8,712,000

- 2007: 109 million sites (Netcraft)
- 2007: 433 million hosts on Internet (ISC)

1998 – 2002: <http://www.oclc.org/research/projects/archive/wcp/stats/size.htm>

Size estimates for the (indexable) Web

- 1995: ~11.4 million docs (Bray)
- 1997: ~200 million docs (Bharat&Broder)
(sampling based on Hotbot, Altavista, Excite and Infoseek, overlap ~2%)
- 1998: >800 million docs (Lawrence&Giles)
- January 2005: 11.5 billion docs (Gulli&Signorini)
(sampling based on Google, MSN, Yahoo! and Ask/Teoma)
- 2005: 19.2 billion documents in Yahoo! index
- 2008: >1 trillion documents counted by Google

<http://googleblog.blogspot.com/2008/07/we-knew-web-was-big.html>



The Web is infinite – and growing

- Non-indexable Web not seen by search engines („**Deep Web**“ behind forms):
 - est. 550 billion docs,
 - est. 7.5 petabytes in 2000 (Bright Planet)
- **User-generated content** (social networks, communities, wikis, blogs, ...)
- **Pages created on demand** („next week“ link in online calendars)

Some social networks

Flickr: (as of Nov 2008)

- 3+ billion photos (2 billion in Nov 2007)
- 3 million new photos per day

Facebook: (as of Nov 2008)

- 10+ billion photos, 30+ million new photos per day
- 120 million active users (31 million in April 2007)
- 150,000 new users per day (100,000/day in April 2007)

Myspace: (as of Apr 2007)

- 135 million users (6th largest country on Earth)
- 2+ billion images (150,000 req/s), millions added daily
- 25 million songs
- 60TB videos

StudiVZ.net: (as of Nov 2008)

- 11 million users
- 300 million images, 1 million added daily

Challenges: Size dynamics

How can a search engine deal with „infinite“ Web?

- Massively parallel, distributed architecture (MapReduce, Hadoop, etc.)
- Detect and remove noise (duplicates, spam etc.)

Which aspects of the Web are dynamic?

- **Size:** pages added and deleted all the time
- **Content:** pages change all the time

Evolution of the Web (Ntoulas et al., 2004)

Large-scale study:

- October 2002 – October 2003
- Weekly crawls of 154 large Web sites (up to 200,000 pages per site)

Average page creation per week

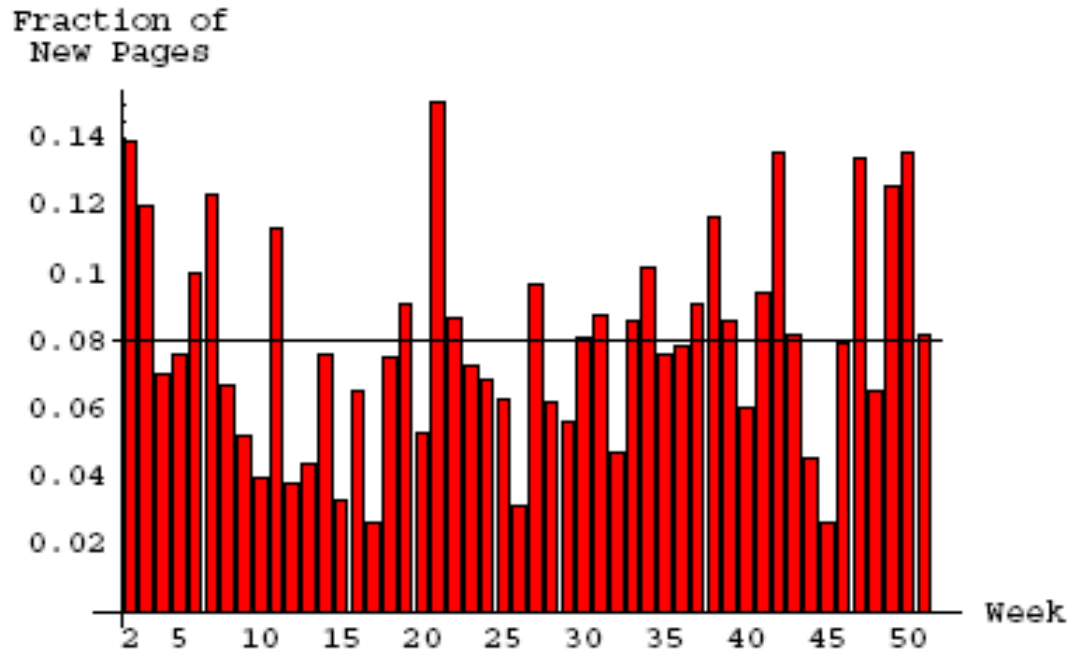


Figure 1: Fraction of new pages between successive snapshots.

About 8% new pages created per week

(A. Ntoulas, J. Cho, C. Olston: What's new on the Web? The Evolution of the Web from a search engine perspective, WWW Conference, 2004)

How long do pages live?

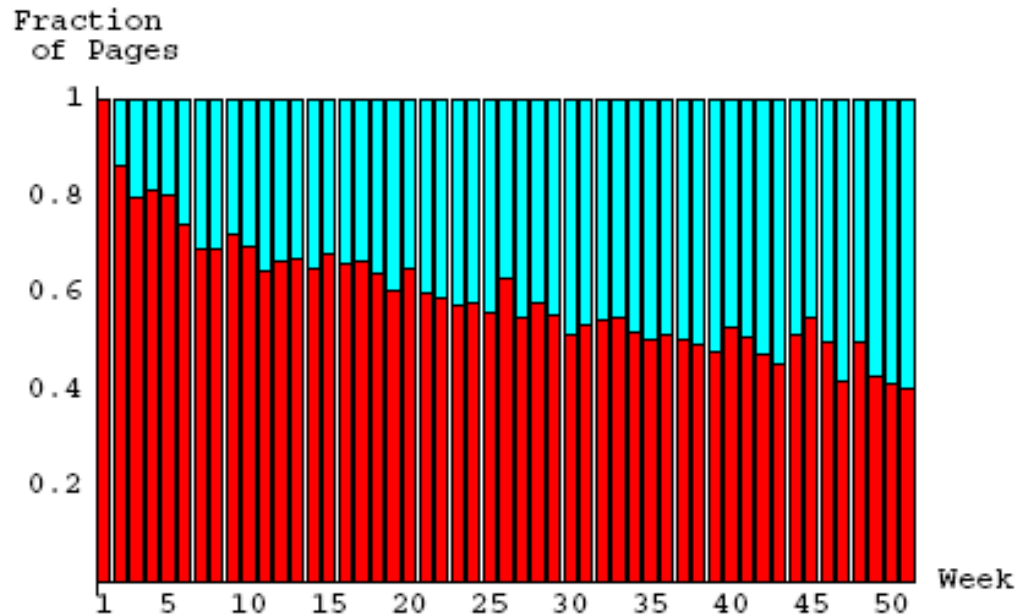


Figure 3: Normalized fraction of pages from the first crawl still existing after n weeks (dark bars) and new pages (light bars).

About 40% of the pages still available after one year

(A. Ntoulas, J. Cho, C. Olston: What's new on the Web? The Evolution of the Web from a search engine perspective, WWW Conference, 2004)

How frequently does a page change?

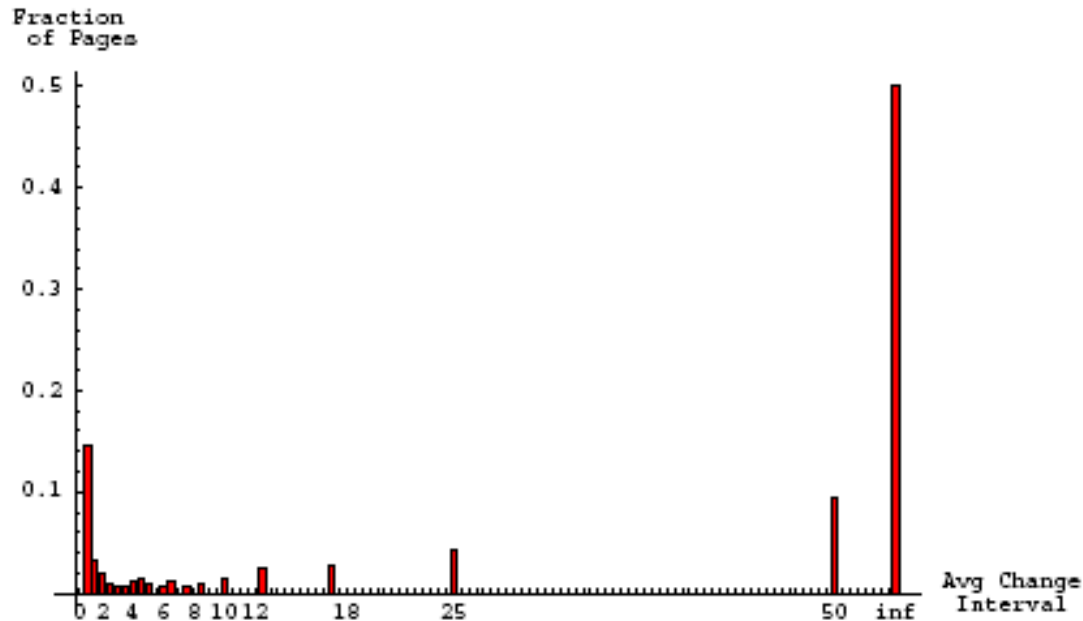


Figure 10: Distribution of the average change intervals of the pages.

Most pages never change, second most change at least weekly

(A. Ntoulas, J. Cho, C. Olston: What's new on the Web? The Evolution of the Web from a search engine perspective, WWW Conference, 2004)

How much do pages change?

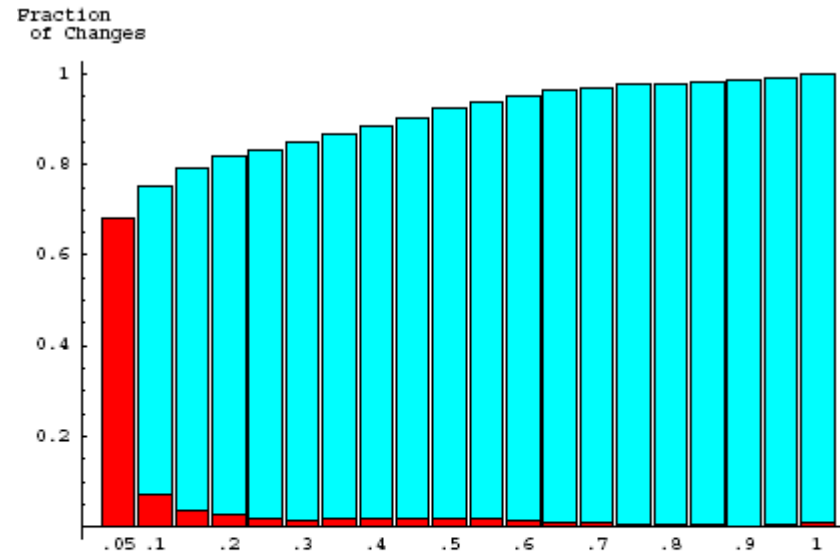


Figure 11: Distribution of cosine distance for all changes. Each dark bar corresponds to changes with cosine distance between the respective x-axis value and the previous one. For example, bin 0.1 corresponds to changes with cosine distance between 0.05 and 0.1. The light bars show the cumulative distribution.

Most of the changes are minor

(A. Ntoulas, J. Cho, C. Olston: What's new on the Web? The Evolution of the Web from a search engine perspective, WWW Conference, 2004)

How large are pages?

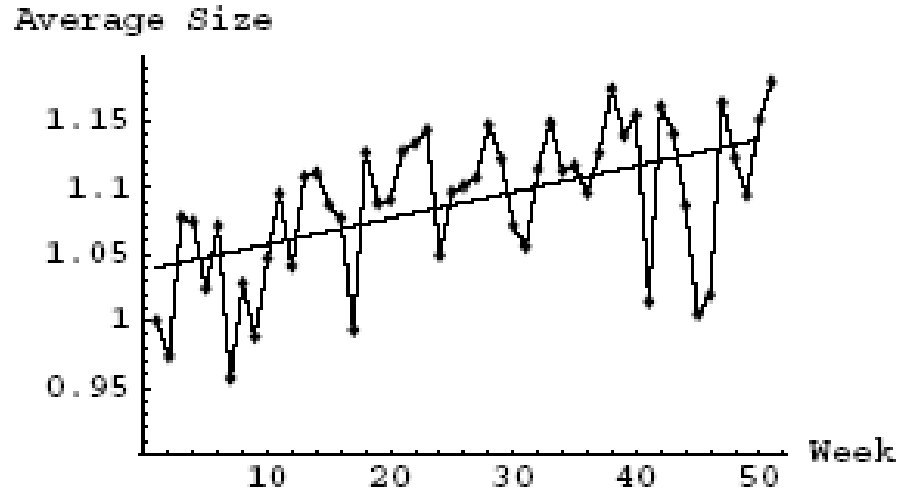


Figure 5: Average page sizes in our snapshots over time.

Average size raised by about 15% in one year

(A. Ntoulas, J. Cho, C. Olston: What's new on the Web? The Evolution of the Web from a search engine perspective, WWW Conference, 2004)

More recent numbers...

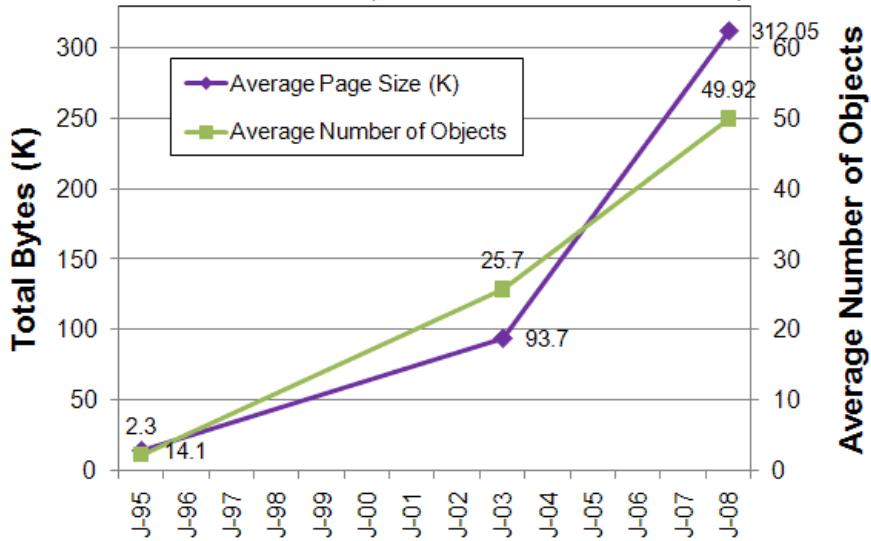
- Average size of Web pages more than tripled since 2003 from 93.7K to over 312K
- Average number of objects per Web page nearly doubled from 25.7 to 49.9
- Since 1995 average size of Web pages increased by 22 times
- Since 1995 average number of objects per Web page increased by 21.7 times

(from <http://www.websiteoptimization.com/speed/tweak/average-web-page/>)

More recent charts...

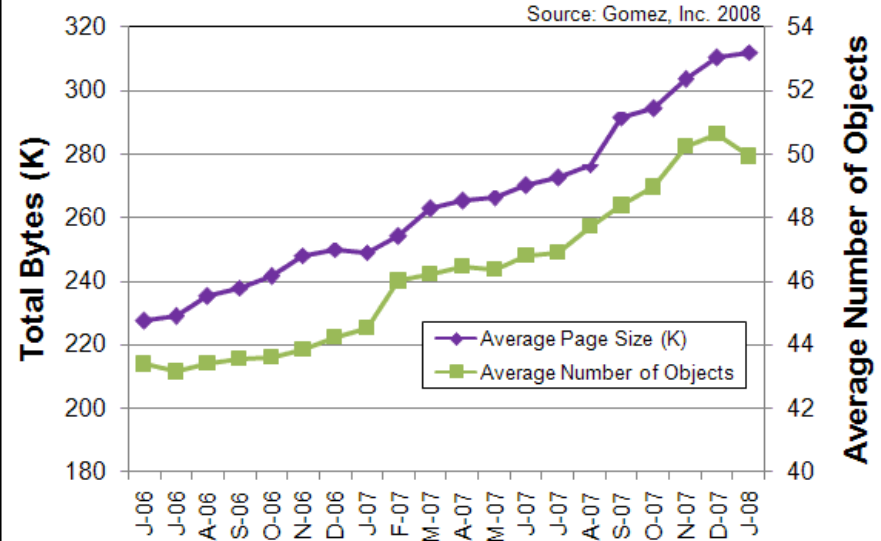
Growth of Average Web Page Size and Number of Objects

(Sources: Domenech 2007, Gomez 2008)



Top 1000 Home Page Growth - Average Size and Number of Objects from June 2006 to January 2008

Source: Gomez, Inc. 2008



(from <http://www.websiteoptimization.com/speed/tweak/average-web-page/>)

Challenges: Content dynamics

How can a search engine maintain a reasonably accurate snapshot of the Web?

- Model how/when documents updated
- Recrawl policy based on expected changes
- Decide if a page's content changed (enough to replace old version in snapshot)

How can we maintain the Web of the past?

- Web archiving

Which aspects of the Web are dynamic?

- **Size:** pages added and deleted all the time
- **Content:** pages change all the time
- **Structure:** links added all the time (and dropped)

How frequently do links change?

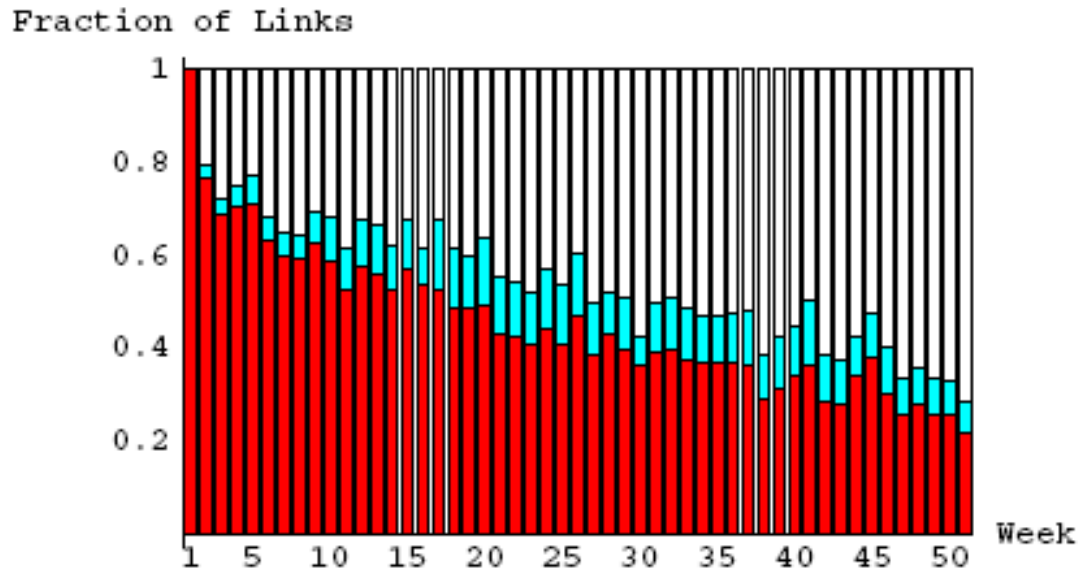


Figure 9: Normalized fraction of links from the first weekly snapshot still existing after n weeks (dark/bottom portion of the bars), new links from existing pages (grey/middle) and new links from new pages (white/top).

25% new links created per week, 80% of links replaced within a year

(A. Ntoulas, J. Cho, C. Olston: What's new on the Web? The Evolution of the Web from a search engine perspective, WWW Conference, 2004)

Challenges: Structure dynamics

How can a search engine maintain a reasonably accurate snapshot of the Web graph?

- Massively parallel, distributed architecture (MapReduce, Hadoop, etc.)
- Distributed approximation algorithms for computing authority measures (PageRank)

Which aspects of the Web are dynamic?

- **Size:** pages added and deleted all the time
- **Content:** pages change all the time
- **Structure:** links added all the time (and dropped)
- **Usage:** Behaviour of users changes all the time

Reasons why user behaviour changes

- Global trends and changes, Web 2.0 (Flickr, Youtube, social networks, twitter, ...)
 - Different situation/context
 - Roles (private vs. professional)
 - Locations (home vs. office vs. travelling)
 - Date & Time
 - Tasks (ordering a book, booking a flight, ...)
- ⇒ **influence browsing and search behaviour**

Challenges: User dynamics

How can a search engine adapt to changing users?

- Identify user (e.g., Google's cookie)
- Collect user behaviour
- Personalize search results based on past actions
- Personalize based on current context

This can be done

- For each user
- For groups of users
- For all users („global user model“)

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Google Trends: Search stats

Google Trends: audi,mercedes,bmw,dacia - Windows Internet Explorer

http://www.google.com/trends?q=audi,mercedes,bmw,dacia&date=all&geo=deu&ctab=0&sort=0&sa=N

File » Google g thomas jefferson Suche » Suchen Übersetzen AutoFill

Google Trends: audi,mercedes,bmw,dacia



audi,mercedes,bmw,dacia

Search Trends

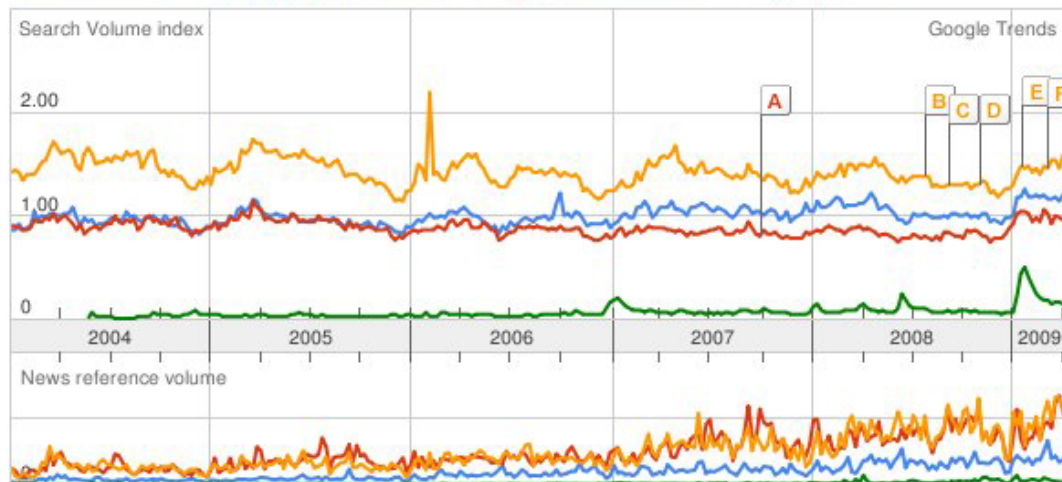
Tip: Use commas to compare multiple search terms.

Searches Websites

Germany

Scale is based on the average traffic of audi from Germany in all years. [Learn more](#)

audi 1.00 mercedes 0.88 bmw 1.42 dacia 0.06



- A [Daimler revives the Mercedes-Benz brand](#)
Euronews.net - Oct 4 2007
 - B [BMW's 2Q profit slides, dumps profit forecast](#)
Boston Herald - Aug 1 2008
 - C [Villegas wins BMW Championship](#)
cbs4qc.com - Sep 7 2008
 - D [BMW 3Q net profit falls 63 percent](#)
Washington Times - Nov 4 2008
 - E [BMW, Volkswagen reduce work hours](#)
The Oregonian - OregonLive.com - Jan 20 2009
 - F ['Swiss Gigolo' admits to defrauding BMW heiress](#)
The Flint Journal - MLive.com - Mar 9 2009
- [More news results »](#)

http://www.google.com/trends

Rank by audi

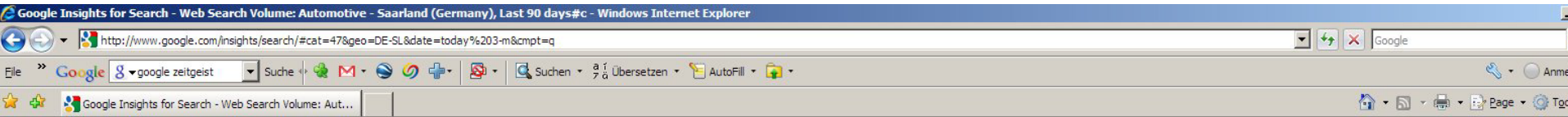
Subregions

1. [Bayern](#), Germany
2. [Baden-Württemberg](#), Germany
3. [Niedersachsen](#), Germany

Cities

1. Ingolstadt, Germany
2. Isernhagen, Germany
3. Heilbronn, Germany

Google insights: Trends in searches



raif.schenkel@gmail.com | [My Account](#) | [Help](#) | [Sign out](#) | [Download as CSV](#)

Compare by	Search terms	Filter
<input checked="" type="radio"/> Search terms <input type="radio"/> Locations <input type="radio"/> Time Ranges	Tip: Use quotation marks to match an exact phrase. ("table tennis") <input type="text" value="All search terms"/> + Add search term	Web Search Germany Saarland Last 90 days Automotive <input type="button" value="Search"/>

Web Search Volume: Automotive

Saarland (Germany), Last 90 days

[All Categories](#) > Automotive

Interest over time News is unavailable for specific categories. [Learn what these numbers mean](#)



Search terms in Automotive Saarland, Last 90 days

Top searches

1.	bmw	100
2.	auto	95
3.	vw	90
4.	ford	90
5.	audi	85
6.	peugeot	70
7.	opel	65
8.	mercedes	65

Rising searches

1.	hyundai	+140%
2.	jahreswagen	+110%
3.	felgen	+90%
4.	dacia	+90%
5.	polo	+70%
6.	fiat	+70%
7.	skoda	+60%
8.	seat	+60%

<http://www.google.com/insights>

Google Website trends: access stats

Google Trends for Websites: audi.de, bmw.de, dacia.de - Windows Internet Explorer

http://trends.google.com/websites?q=audi.de%2C+bmw.de%2C+dacia.de&geo=all&date=all&sort=0

File >> Google g google zeitgeist Suche <> Suchen > Übersetzen > AutoFill >

Google Trends for Websites: audi.de, bmw.de, dacia.de



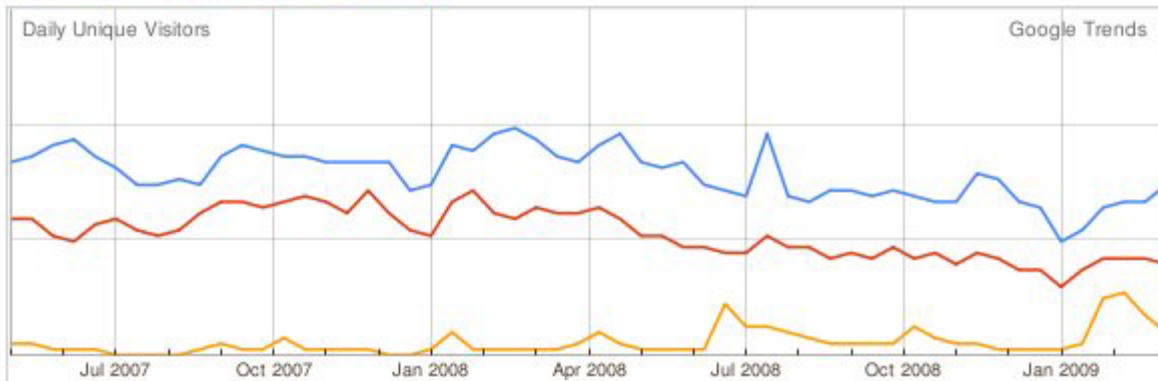
audi.de, bmw.de, dacia.de

Search Trends

Tip: Use commas to compare multiple websites.

Searches Websites

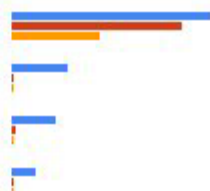
● audi.de ● bmw.de ● dacia.de



Ranked by: audi.de [Learn more](#)

Regions

1. [Germany](#)
2. [United States](#)
3. [Italy](#)
4. [France](#)



Also visited

1. [audi-umweltpraemie-plus.de](#)
2. [audi.com](#)
3. [audi.it](#)
4. [audi.fr](#)



http://trends.google.com/

Google News Timeline: News trends

Google News Timeline - Windows Internet Explorer

http://newstimeline.googlelabs.com/?q=financial+crisis&corpus=news

Google News Timeline

Google News Labs

Example: financial crisis

Climate Change News [save](#) Time Magazine [Wikipedia](#) [Events](#) [Add More Queries](#)

Show: Decade Size: Medium Date: Go

1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2010s
<p>February 23rd, 1931 COOL CHANGE AFTER THE HOT SPELL. A Storm Study Canberra Times: COOL CHANGE. AFTER THE HOT SPELL. <A Storm Study>... i The capricious nature of the climate in Canberra Was demostiated pn Sat- ...</p> <p>January 30th, 1932 PHAR LAP IN MEXICO. THE PROBLEM OF REVERSED SEASONS. The Argus: phantom climate. Change of hemisphere in the South African over led to frightful mortality among English horses. for the poor bcaets had to face the ?wind- ...</p> <p>February 23rd, 1934 Display Advertising Canberra Times: how unsuited it is to our.. life and climate! Change to the 1934 breakfast crisp, ready-to-eat, nour- ishing Kellogg's Corn Flakes. You'll enjoy a ...</p> <p>April 13th, 1934 Display Advertising Canberra Times: life and climate! Change to the 1934 breakfast crisp, ready-to-eat, nour- ishing Kellogg's Corn Flakes. You'll enjoy a new feeling of energy! ...</p> <p>October 19th, 1934 Display Advertising Canberra Times: life and climate! Change to the 1934 breakfast crisp, ready-to-eat, nour- ishing Kellogg's Corn Flakes. You'll enjoy a new feeling of energy! ...</p> <p>December 7th, 1934 Display Advertising Canberra Times:</p>	<p>August 4th, 1940 Season Change Held To Raise Quake Dangers. St. Petersburg Times: St. Petersburg Times: ... he said, when changing climate conditions produce a transport of Urge sir masses from one hem I to another A change in mass distribution on the earth re ...</p> <p>December 21st, 1942 Worm Weather Greets Eagles. St. Petersburg Times: Why, they had to shovel snow off the field so we could run signals He expects no particular difficulty from the change in climate. can handle heat in two ...</p> <p>November 15th, 1943 Background and Results Time Magazine: Change of Climate. The first tangible result of Moscow was a fundamental change in the diplomatic climate of Europe. Areas of disagreement, acts that ...</p> <p>January 22nd, 1945 South Wind A Political Change In The South. St. Petersburg Times: Times: A more benign voting climate is in the making. The effects of the Atlanta conference may not be visible for some time, but I will hazard this forecast ...</p> <p>October 25th, 1945 BEAUTIFICATION OF CANBERRA STREETS Change-Over to Permanent Trees Canberra Times:</p>	<p>February 16th, 1950 Weather Changes Abruptly. St. Petersburg Times: JT Drip of The Times, who has been demanding a change in climate for days, was not available for comment last night. Weathermen explained that a cold air ...</p> <p>September 1st, 1951 Ginkgo Logs Exceptional In Forest. More Familiar American Trees Outnumber Them. Ellensburg Daily Record: tropical climate withdraw southward. The countless kinds of new virile ... Series of raft Evolution naturally advances most where conditions change the most ...</p> <p>November 25th, 1952 No Place To Hide. David Lawrence. A Change In The Washington Climate. Rome News-Tribune: The Washington climate The cabinet appointments already announced by President-elect Eisen hower indicate it. No longer will the political class ...</p> <p>February 2nd, 1954 Ike Puts Tremendous Job In Hands Of Businessmen. St. Petersburg Times: We're set to do s lot more to help. we're going to change the tax laws to you ... favorable climate here then is your favorable climate Mr. Businessman. the ...</p>	<p>October 5th, 1961 The World BA Warmer Place To Live. St. Petersburg Times: What's wrong is the people who live in the climate don't change enough Yesterday's High Law. JT Drip, Times meteorologist who was not invited to the an ...</p> <p>September 15th, 1962 Forecaster Predicts Milder Winter Here. Science And You. Pittsburgh Post-Gazette: He says we're about at the point where the climate will change from warm and dry. ... One reason for their skepticism was their beli'efe that climate change ...</p> <p>March 4th, 1965 Change Of Climate Lent Needed In Capital, Too. James J. Kilpatrick. The Evening Independent: time, here in our own country, when priests and ministers exhort their flocks to get back to fundamentals. In every town of any size, these next six weeks ...</p> <p>October 26th, 1966 Climate May Not Help Lung Case. Pittsburgh Post-Gazette: There is this one thing to be said for change in climate. ... That is why I am always reluctant to recommend a change in climate. Too often it doesn't help. ...</p> <p>December 4th, 1966 For A fair climate. St. Petersburg Times:</p>	<p>August 2nd, 1970 Supersonic Transport. St. Petersburg Times: Times: increasing quantities of carbon dioxide in the atmosphere believed to raise temperatures by the greenhouse effect has resulted in little climate change in ...</p> <p>May 1st, 1972 Ling2 and Hsing2 Time Magazine: ... two woebegone musk oxen that arrived with scraggly coats and postnasal drip brought on by the climate change and general cultural shock. ...</p> <p>May 26th, 1972 Summit Creating A Change In International Climate. The Evening Independent: summit already has accomplished much toward creating a different sort of international climate. Is the Kremlin changing is the So viet leadership mellowing ...</p> <p>June 6th, 1972 Reports Global Climate Change. The Virgin Islands Daily News: George former wildlife biologist for the Virgin Islands, suggested recently that Virgin Islanders would have to decide whether they would rather have the ...</p> <p>June 21st, 1974 The Ominous Change In Britain's Climate. St. Petersburg Times:</p>	<p>November 26th, 1981 Mars climate change: where are the petroglyphs? Nature.com: El-Baz, F. in J. geophys. Res. 3rd int. Colloq. on Mars Spec. Issue (in the press). Sharp, RP & Malin, MC Bull. geol. Soc. Am. 86, 593 (1975). ...</p> <p>February 25th, 1983 Global Mean Sea Level: Indicator of Climate Change? Science Magazine: CESS, RD, THE EFFECT OF OCEAN HEAT-CAPACITY UPON GLOBAL WARMING DUE TO INCREASING ATMOSPHERIC CARBON-DIOXIDE. JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS AND ...</p> <p>July 17th, 1987 01:23 InfoWorld: Product Guide: pkfstat: Company infoworld.com: "Climate change is a very real danger facing the world today," said Dr. Zhengrong Shi ... The Global Roundtable on Climate Change which is part of the Earth ...</p> <p>April 15th, 1988 The Greenhouse Theory of Climate Change: A Test by an Inadvertent Global ... Science Magazine: Since the dawn of the industrial era, the atmospheric concentrations of several radiatively active gases have been increasing as a result of human ...</p> <p>July 7th, 1988 Response of northern forests to CO2-induced climate change Nature.com: Climate changes resulting from increases in</p>	<p>January 1st, 1990 Acid Rain Air Quality, Global Change, or What? National Forum: A double-barreled assault by supporters of a strengthened domestic air quality act and by backers of a new initiative to focus on global climate change is ...</p> <p>September 1st, 1990 US and Europe could fall out over climate change New Scientist: See startling photos taken with microscopes, including this chick embryo, melting crystals and slime moulds... See prize-winning photos of a huntsman spider ...</p> <p>September 2nd, 1993 Climate Change Makes Our Hurricanes Worse New York Times: Your Aug. 18 report on preparedness for the hurricane season on the East and Gulf Coasts in the aftermath of 1992's Hurricane Andrew and your Aug. ...</p> <p>September 30th, 1997 THE WARMING WORLD: Coping With Climate Change: If Climate Changes, Who Is ... New York Times: By WILLIAM K. STEVENS. IF mainstream scientists are right in their forecast that the earth will warm up substantially in the decades ahead, what will happen ...</p> <p>December 1st, 1997 GLOBAL WARMING: A Climate Change Glossary New York Times: AEROSOLS -- Particles in the atmosphere. They cool the earth by reflecting sunlight</p>	<p>June 11th, 2001 Transcript: Bush on Climate Change FOXNews: I've just met with senior members of my administration who are working to develop an effective and science-based approach to addressing the important issue ...</p> <p>July 7th, 2005 G8 prepares climate change statement BBC News: By Steve Schifferes. It was meant to be the day that global leaders finally sat down and discussed climate change. A few minutes before the attacks on ...</p> <p>December 10th, 2005 US walks out of climate change talks as 150 nations move forward to adopt Kyoto Independent: By Andrew Buncombe in Montreal. The Bush administration's unwillingness to seriously confront global warming was increasingly at odds with the rest of the ...</p> <p>October 29th, 2006 £3.68 trillion: The price of failing to act on climate change guardian.co.uk: Britons face the prospect of a welter of new green taxes to tackle climate change, as the most authoritative report on global warming warns it will cost the ...</p> <p>November 15th, 2006 UN's Annan warns of 'frightening lack of leadership' over climate change</p>	

Google Web timeline: Date extraction

thomas jefferson view:timeline - Google Search - Windows Internet Explorer

http://www.google.com/views?q=thomas+jefferson%20view%3Atimeline&esrch=RefinementBarTopViewTabs

File » Google g thomas jefferson Suche » Suchen Übersetzen AutoFill

thomas jefferson view:timeline - Google Search

Web Images Maps News Video Mail more

Google Experimental LABS thomas jefferson view:timeline Search Advanced Search Preferences

You are trying the **Alternate views for search results** experiment. [Take our survey](#) | [Return to experiments overview](#)

Timeline View

List view Info view Timeline view Map view

1740 - 1820

Only show results circa: Set filter
E.g. "January 1975" or "1700-1750"

[Biography of Thomas Jefferson](#)

1786 - Most notably, he wrote a bill establishing religious freedom, enacted in 1786. **Jefferson** succeeded Benjamin Franklin as minister to France in 1785.

1800 - In the thick of party conflict in 1800, **Thomas Jefferson** wrote in a private letter, "I have sworn upon the altar of God eternal hostility against every form of ..."

www.whitehouse.gov

[Thomas Jefferson - Wikipedia, the free encyclopedia](#)

April 13, 1743 - **Thomas Jefferson** (April 13, 1743 – July 4, 1826) [1] was the third President of the United States (1801–1809), the principal author of the Declaration of ...

en.wikipedia.org

[Thomas Jefferson](#)

Apr. 13, 1743 - **Jefferson** was born at Shadwell in what is now Albemarle County, Va., on Apr. 13, 1743. He treated his pedigree lightly, but his mother, Jane Randolph **Jefferson**, ...

1801 ... as secretary of state under George Washington, as vice president in the

Google Zeitgeist: Frequent searches



Zeitgeist Home | Google.com

Home

US Zeitgeist

Top of Mind

Politics

Trendsetters

Showbiz

Sports

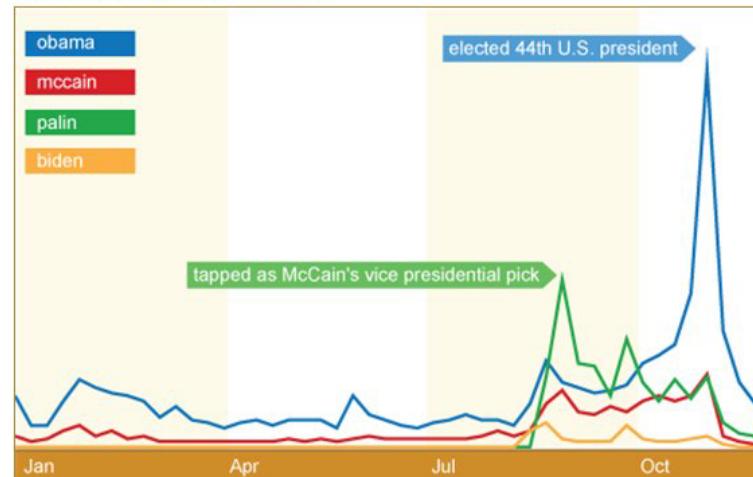
Around the World

Politics

With no shortage of groundbreaking moments and milestones, the 2008 U.S. presidential campaign is one for the history books.

All of these searches had the largest volume on Google.com in the U.S.

The Race to the Finish Line



Top Sources for Political News

1. fox
2. cnn
3. abc
4. cbs
5. msnbc
6. drudge report
7. new york times

Campaign Buzzwords

1. joe the plumber
2. jeremiah wright
3. maverick
4. william ayers
5. bridge to nowhere
6. lipstick pig
7. yes we can
8. that one

Internet Archive: Wayback machine

Internet Archive Wayback Machine - Windows Internet Explorer

http://web.archive.org/web/*/http://www.cs.uni-sb.de

File >> Google g ny web pages google Suche <> Suchen Übersetzen AutoFill

Internet Archive Waybac... x http://www.cs.uiowa.edu/~...



Enter Web Address:

All

Take Me Back

Searched for <http://www.cs.uni-sb.de>

Note some duplicates are not shown. [See all](#).

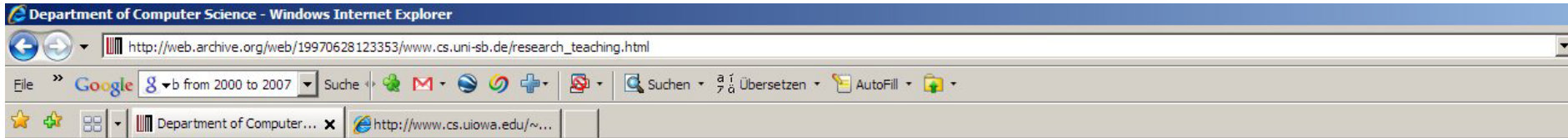
* denotes when site was updated.

Material typically becomes available here 6 months after collection. [See FAQ](#).

Search Results for Jan 01, 1996 - Oct 2

1996	1997	1998	1999	2000	2001	2002	2003
0 pages	4 pages	2 pages	8 pages	11 pages	16 pages	4 pages	12 pages
	Jun 28, 1997 * Jul 25, 1997 Oct 24, 1997 * Dec 11, 1997 *	Jan 23, 1998 Dec 12, 1998 *	Jan 17, 1999 * Jan 25, 1999 * Jan 27, 1999 Feb 08, 1999 Feb 22, 1999 Apr 24, 1999 * Apr 27, 1999 Apr 29, 1999	Feb 29, 2000 * Mar 01, 2000 May 11, 2000 * May 20, 2000 * Jun 07, 2000 * Jun 21, 2000 Oct 17, 2000 * Oct 18, 2000 Oct 19, 2000 Nov 10, 2000 * Dec 07, 2000 *	Feb 24, 2001 * Feb 26, 2001 Mar 01, 2001 Mar 02, 2001 Mar 08, 2001 * Apr 01, 2001 * Apr 04, 2001 * Apr 05, 2001 Apr 10, 2001 * Apr 13, 2001 Apr 17, 2001 Apr 18, 2001 Apr 19, 2001 Apr 23, 2001 Apr 28, 2001 * Oct 24, 2001 *	Sep 26, 2002 * Oct 16, 2002 * Nov 22, 2002 * Nov 24, 2002	Jan 29, 2003 Feb 16, 2003 Mar 20, 2003 Mar 21, 2003 Apr 08, 2003 Jun 23, 2003 Jul 20, 2003 Sep 21, 2003 Oct 07, 2003 Oct 22, 2003 Nov 23, 2003 Nov 28, 2003

Internet Archive: Wayback machine



Universität
des
Saarlandes

FB 14 -
Informatik



This is the Home Page of the **Computer Science Department** of the University of Saarland.

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References

- T. Bray: **Measuring the Web**, WWW Conference, 1996.
- K. Bharat, A. Broder: **A technique for measuring the relative size and overlap of public web search engines**, WWW Conference, 1998
- A. Gulli, A. Signorini: **The Indexable Web is more than 11.5 billion pages**, WWW Conference, 2005
- S. Lawrence and C. L. Giles: **Accessibility of information on the web**, *Nature*, 400:107–109, 1999
- J. Domenech et al.: **A user-focused evaluation of web prefetching algorithms**, *Computer Communications* 30:10, 2213-2224, 2007
- R. Sadre, B. Haverkort: **Changes in the Web from 2000 to 2007**, Workshop on Distributed Systems: Operations and Management, 2008
- K.M. Risvik, R. Michelsen: **Search engines and Web dynamics**, *Computer Networks* 39, 289—302, 2002
- Y. Ke et al.: **Web dynamics and their ramifications for the development of Web search engines**, *Computer Networks* 50, 1430-1447, 2006
- R. Baeza-Yates et al.: **Web structure, dynamics and page quality**, SPIRE Conference, 2002
- V.N. Padmanabhan, L. Qiu: **The content and access dynamics of a busy Web site: Findings and implications**, SIGCOMM conference, 2000
- L. Cherkasova, M. Karlsson: **Dynamics and evolution of Web sites: Analysis, metrics and design issues**, IEEE International Symposium on Computers and Communications, 2001
- J. Cho, H. Garcia-Molina: **Estimating frequency of change**, *Transactions on Internet Technologies* 3(3):256—290, 2003
- J. Cho, H. Garcia-Molina: **The evolution of the Web and implications for an incremental crawler**. VLDB Conference, 2000
- A. Ntoulas, J. Cho, C. Olston: **What’s new on the Web? The Evolution of the Web from a search engine perspective**, WWW Conference, 2004