

21. Search Models and UIs for IR

INFO 202 - 10 November 2008

Bob Glushko

Plan for Today's Lecture

The "Classical" Model of Search and the "Classical" UI for IR

Web-based Search

Best practices for UIs in query specification, query results, and query reformulation

A Range of Information Needs

Citations to documents

Answers to specific questions

Comparison of similar items

Familiarization (browsing and "building upon")

Knowledge discovery / data mining

Some General Usability Goals for IR Systems

From Shneiderman, Byrd, & Croft, Clarifying Search, DLIB Magazine, Jan 1997. www.dlib.org

Strive for Consistency

Provide Shortcuts

Offer Informative Feedback

Design for Closure

Provide Simple Error Handling

Permit Easy Reversal of Actions

Support User Control

Reduce Short-term Memory Load

The "Classical" IR System: Searching for Citations or Documents

Early in the digital era (1970s) large specialized bibliographic collections were created for academic articles, legal cases and opinions, news articles, etc.

The users of these systems were reference librarians, paralegals, journalists, and other professionals willing to be trained in using them

Since these systems predated the PC and graphical terminals, their user interfaces used "command lines"

The command languages were complex and powerful, typically supporting Boolean, adjacency, and term stemming operators

```
(PCR OR POLYMERASE(W)CHAIN(W)REACTION? OR DNA(W)SEQUENC?) AND  
(CANCER? OR PRECANCER? OR NEOPLASM? OR CARCINO?)
```

The Classical Model of Search

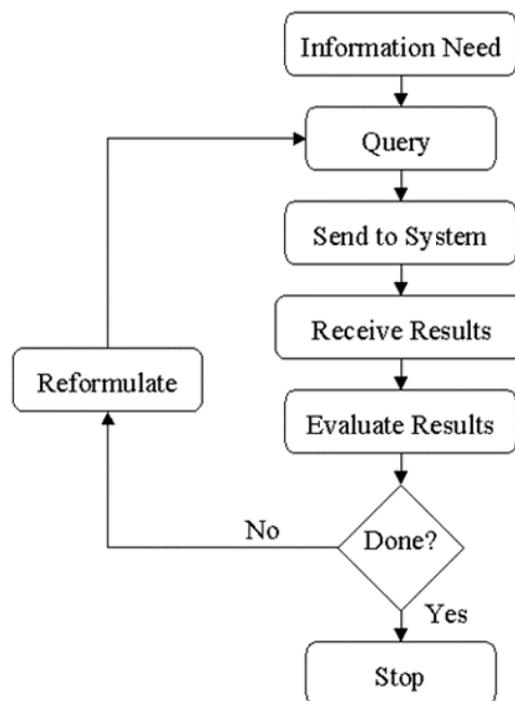
Assumes a "go to the library and use the IR system" approach, where the user is either a trained searcher or has a trained searcher acting as an intermediary actually doing the search

Assumes the information need remains the same throughout the search process

Goal is to maximize recall and precision simultaneously

The value is in the retrieved document set

Processing Model in Classical Search



Query Specification in "Classic" Search UI

```
?s (biometric? and security)/TI,LP
    1621 BIOMETRIC?/TI,LP
    40268 SECURITY/TI,LP
S1      678 S (biometric? and security)/TI,LP
?s S1 and CS=(HARVARD AND MEDIC?)
S2      52 S1 and CS=(HARVARD AND MEDIC?)
?T S2/3/1-10
```

Challenges Posed by the "Classic" IR UI

Untrained users (e.g. with public access terminals in libraries) generally couldn't use these systems effectively on their own

But effective use is essential in narrow and specialized domains where high recall is mandated

Classic Query Specification "Webified" -- 1998

The screenshot shows a web-based interface for a search system. At the top, there is a "Search History" section with a "Database Details" link. Below this is a table with three columns: "Set", "Term Searched", and "Items". The table contains three rows of search results. To the right of the table, there are controls for "Format" (set to "Free") and "Number of Records" (set to "10"). Below the table, there is a section for "Show Database Details for:" with a dropdown menu showing "149: Health & Wellness Database(SM)". To the right of this dropdown are buttons for "Bluesheet" and "Rates". Below these are buttons for "Fields", "Formats", "Sorts", "Limits", and "Tags". At the bottom, there is a "Command" field containing the query "s s1 and s2 and s3", with "Submit" and "Previous" buttons to its right. A copyright notice "© 1998 The Dialog Corporation, Inc." is visible in the footer.

Set	Term Searched	Items
S1	MELANOMA OR SKIN (3N)CANCER?	1264
S2	PREVENT? OR PROTECT?	28430
S3	ULTRAVIOLET OR UV OR SUN OR SUNSCREEN	1886

Format: Free
Number of Records: 10

Show Database Details for:
149: Health & Wellness Database(SM)

Fields Formats Sorts Limits Tags

© 1998 The Dialog Corporation, Inc.

Command | s s1 and s2 and s3 | Submit Previous

Classic Source and Field Selection "Webified" -- 1998

↑ Top : ↑ Medicine and Pharmaceuticals : ↑ Research and Development : ↑ Medicine : ↓ Articles by Author

 Targeted Search: Articles by Author

▶ Search Form

Sources BIOSIS® CAB Ei Compendex® EMBASE®
 INSPEC JICST MEDLINE® NTIS
 PASCAL SciSearch® All

Author Last First Initial

Author's Organization

Words in Title

Publication

Language Any Language English Only

Year All Years From To

Classic Query Specification "Webified" -- 2007

http://web.lexis.com - lexis.com® Tutorial - Mozilla Firefox

File Edit View History Bookmarks Tools Help deljcio.us

Search By Topic

LexisNexis® Total Research

My Lexis™ Search Research

by Source by Topic or Headnote

All Topics > Copyright Law

Option 1 - Search across

Search for 'General Overview'

1 Jurisdiction

2 Sources

3 Search Terms (Optional)

Terms and Connectors Natural Language

[Suggest Terms for My Search](#)

Select Sources (up to 50) [Clear All](#)

Cases

<input checked="" type="checkbox"/> 1st Circuit - Federal & State Cases, Combined i	<input type="checkbox"/> MA Federal & State Cases, Combined i
<input type="checkbox"/> 2nd Circuit - Federal & State Cases, Combined i	<input type="checkbox"/> MD Federal & State Cases, Combined i
<input type="checkbox"/> 3rd Circuit - Federal & State Cases, Combined i	<input type="checkbox"/> ME Federal & State Cases, Combined i
<input type="checkbox"/> 4th Circuit - Federal & State Cases, Combined i	<input type="checkbox"/> MI Federal & State Cases, Combined i
<input type="checkbox"/> 5th Circuit - Federal & State Cases, Combined i	<input type="checkbox"/> MN Federal & State Cases, Combined i
<input type="checkbox"/> 6th Circuit - Federal & State Cases, Combined i	<input type="checkbox"/> MO Federal & State Cases, Combined i
<input type="checkbox"/> 7th Circuit - Federal & State Cases, Combined i	<input type="checkbox"/> MS Federal & State Cases, Combined i
<input type="checkbox"/> 8th Circuit - Federal & State Cases, Combined i	<input type="checkbox"/> MT Federal & State Cases, Combined i
<input type="checkbox"/> 9th Circuit - Federal & State Cases, Combined i	<input type="checkbox"/> NC Federal & State Cases, Combined i
	<input type="checkbox"/> ND Federal & State Cases, Combined i
	<input type="checkbox"/> NE Federal & State Cases, Combined i
	<input type="checkbox"/> NH Federal & State Cases, Combined i
	<input type="checkbox"/> NJ Federal & State Cases, Combined i

From To [Date For](#)

What's this?
Retrieve all headnotes classified to the topic or case

Searching the Web

The size and scope of the Web is vastly greater than any "classic" bibliographic or document collection

But the scope of what people search for is also vastly greater than in classical IR systems

People expect to get information and documents, rather than just citations

Challenges Posed by Searching the Web

UIs must accommodate differences among people in:

- Knowledge / life experience
- Cultural background and expectations
- Reading / scanning ability and style
- Methods of organizing and looking for things

UI functionality is constrained by heterogeneity of content (e.g., can't assume complete and consistent metadata or structure)

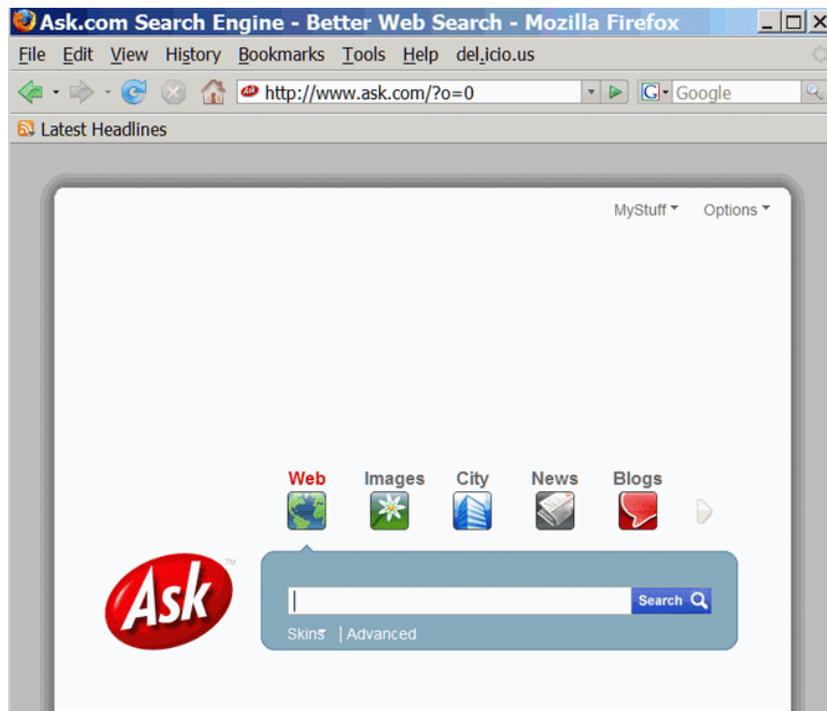
So what this means in practice is that the default web search UI is the simplest possible one: just a search box...

Additional challenges arise because people have multiple devices on which they want to search the Web and many have limited capabilities for UIs

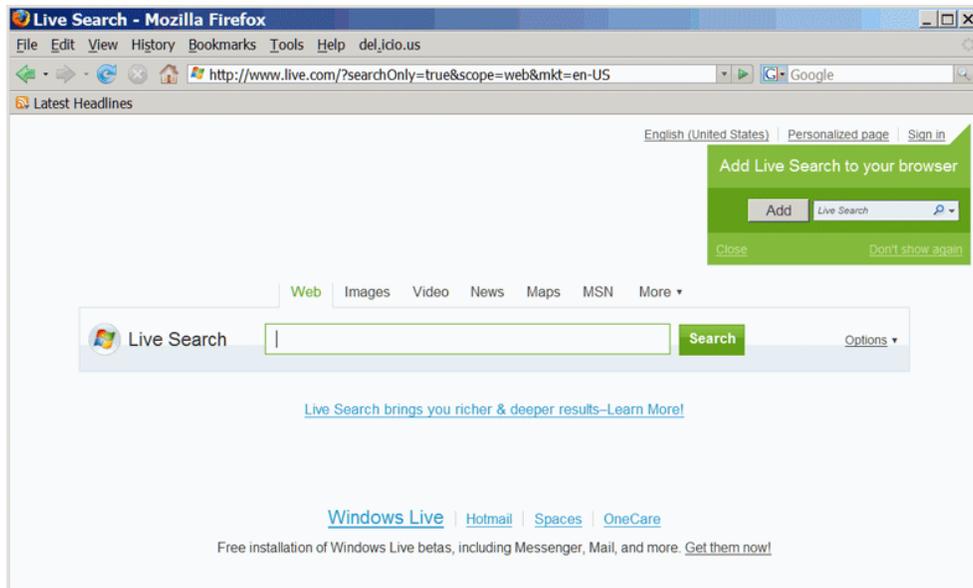
Google's Default Search UI



Ask's Default Search UI



Microsoft Live Search Default Search UI



Yahoo! Default Search UI



"Ordinary" People Just Don't Get IR

1 in 7 never type URLs in the address bar and others use it wrong

Some use "URL style" (no spaces between words) when entering words into query forms

Only 1 in 6 uses quotes in query forms, and many of these do so incorrectly

Almost no use of any advanced search syntax or functions

They don't appreciate the "vocabulary problem," so if their first query term doesn't work, they just give up rather than trying other terms

"Ordinary" People Don't Understand Boolean Operators

For most people, Boolean semantics are counterintuitive or backwards

- Boolean AND narrows a search, but natural language "and" implies a request for more information
- Likewise, Boolean OR is a union that widens a search, while "or" implies a mutually exclusive choice in everyday language

"Ordinary" People Don't Understand Text Processing in IR Systems

If very frequent words ("stop words") are removed by the search engine, a query like "To be or not to be" won't find anything

A query like "boat fire" is different from "fire boat" but many users don't realize that term order matters

The Search Process and Interface Components

Hearst says "the heart of the search process is an iterative cycle of query specification, inspection and interpretation of query results, and query reformulation"

- Query Specification: Selecting and structuring search terms
- Query Results: Ordered list of documents or other objects matching the query
- Query Reformulation: If nothing in the results satisfies the query, users modify their initial queries and submit new ones

Small Details Matter

UIs for IR require great care in small details because of the text-intensive nature of search

- Tension between more information and clutter

How and where to arrange components of the interface and results matters a lot (cf. [Tidwell's principles](#))

- People don't read instructions or help text
- People scan / skim rather than read

Best Practices in Query Specification

Provide advanced capabilities for defining queries and constraining results, but progressively disclose them to hide complexity

Query suggestions

Query expansion and contraction (also used in query refinement stage) that is TRANSPARENT to the user

DWIM / spelling correction

Google Advanced Search

The screenshot shows the Google Advanced Search page in a Mozilla Firefox browser window. The address bar displays the URL http://www.google.com/advanced_search?hl=en. The page features the Google logo and the text "Advanced Search" with links for "Advanced Search Tips" and "About Google".

The main search area includes a "Find results" section with radio buttons for "with all of the words", "with the exact phrase", "with at least one of the words", and "without the words". There are input fields for search terms and a "Google Search" button. A "10 results" dropdown is also visible.

Below this are various filters:

- Language:** Return pages written in [any language]
- File Format:** Only [return results of the file format] [any format]
- Date:** Return web pages first seen in the [anytime]
- Numeric Range:** Return web pages containing numbers between [] and []
- Occurrences:** Return results where my terms occur [anywhere in the page]
- Domain:** Only [return results from the site or domain] [e.g. google.com, org] [More info](#)
- Usage Rights:** Return results that are [not filtered by license] [More info](#)
- Safe Search:** No filtering Filter using [SafeSearch](#)

At the bottom, there is a "Page-Specific Search" section with two options:

- Similar:** Find pages similar to the page [e.g. www.google.com/help.html] [Search](#)
- Links:** Find pages that link to the page [] [Search](#)

Windows Live Advanced Search

The screenshot shows the Windows Live Search interface in a Mozilla Firefox browser window. The address bar displays the URL <http://search.live.com/results.aspx?FORM=LIVSOP&q=&mkt=en-US&qb=1>. The page features the Windows Live Search logo and navigation links for "Home", "Hotmail", "Spaces", "OneCare", and "Sign in".

The main search area includes a search input field, a "Search" button, and links for "Advanced" and "Options".

Below this is the "Advanced search" section with a close button (x). It includes links for "Search terms", "Site/Domain", "Links to", "Country/Region", and "Language".

The "Find search results that include the following:" section has an input field containing "xml business standard" and an "Add to search" button. A dropdown menu is open, showing options: "All of these terms", "Any of these terms", "This exact phrase", and "None of these terms".

At the bottom, there is a footer with copyright information: "© 2007 Microsoft | Privacy | Legal" and links for "Advertise", "For Webmasters", "Help Central", "Account", and "Feedback".

Query Refinement That No One Knows About

weather: berkeley - Google Search - Mozilla Firefox

File Edit View History Bookmarks Tools Help del_ido.us

http://www.google.com/search?q=weather%3A+berkeley&je=utf-8&oe=utf-8&aq=t&rls=org.mozilla:en-US:official&client=firefox-a

Latest Headlines

Web Images Video News Maps Gmail more ▾ bob.glushko@gmail.com

Google weather berkeley Search Advanced Search Preferences

Web Results 1 - 11

Weather for Berkeley, CA Add to iGoogle

59°F
Haze
Wind: N at 0 mph
Humidity: 81%

Day	High/Low
Fri	67°F 47°F
Sat	70°F 46°F
Sun	68°F 47°F
Mon	68°F 48°F

[Berkeley, California \(94701\) Conditions & Forecast : Weather ...](#)
Want to contribute your **weather** data? The **Weather** Underground has teamed up with Ambient **Weather**, **Weather** Display and **Weather** View 32 to build a network of ...
[www.wunderground.com/US/CA/Berkeley.html](#) - 205k -
Cached - Similar pages - Note this

[Weather Berkeley, California \(94701\) Conditions & Forecast](#)
Weather News: South Bay forecast: No more rain, but cloudy skies ... **Berkeley, CA**
Scattered Clouds ... **Berkeley**, 59°, 54°, 64°, 49°, Scattered Clouds ...
[www.wunderground.com/auto/mercurynews/CA/Berkeley.html](#) - 50k -
Cached - Similar pages - Note this
[More results from www.wunderground.com]

[THE VIEW FROM LHS](#)
OVERVIEW: The goal of this project is to help children understand the **weather** by correlating the view from the Lawrence Hall of Science with **weather** data ...
[sv.berkeley.edu/view/](#) - 9k - Cached - Similar pages - Note this

[Hourly Weather Forecast for Berkeley, CA \(94704\) - weather.com](#)
Hourly **Weather** Forecast for **Berkeley**, California, including an hour-by-hour forecast, **weather** conditions, precipitation, dew point, humidity, and wind.
[www.weather.com/outlook/recreation/outdoors/hourbyhour/94704](#) - 141k -
Cached - Similar pages - Note this

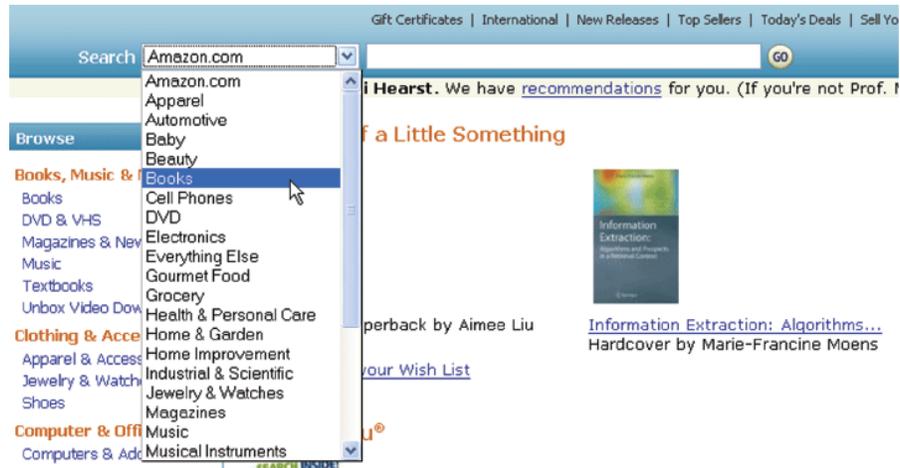
Search Window with Query History

(4)

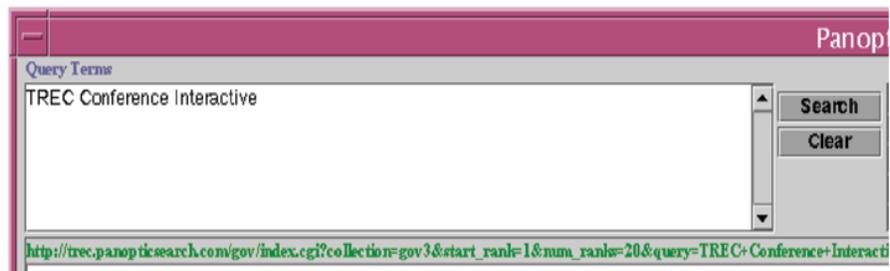
search

- search
- search engines course
- search engines seminar
- search user interfaces
- searchengineland just behave

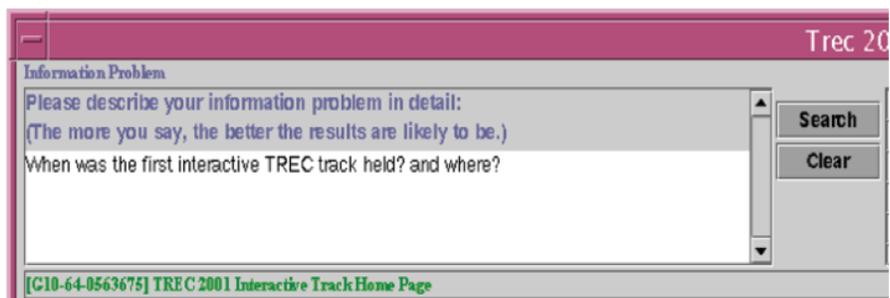
Search Window with Subject Drop Down Menu



Search Window with Terse and Verbose Instruction



(a)



(b)

Query Suggestions in Yahoo!

YAHOO! SEARCH Web | Images | Video | Local | Shopping | more >

Search Results

Also try: [weather forecast](#), [berkeley, california](#), [weather in berkeley wind](#) more...

Extended weather forecast for Berkeley, CA

Currently: 55°F Fair 76°F 56°F	Tuesday Sunny 72°F 56°F	Wednesday Partly Cloudy 67°F 56°F
--	---------------------------------	---

Yahoo! Shortcut - [About](#) - [Get local weather on your cell](#)

- Berkeley Weather Forecast and Conditions California (94704)**
Berkeley weather forecast and weather conditions for 94704. ... Parks in My Area. Nearby Intersections. Event Venues Near Me. Ski Areas Near Me ...
[www.weather.com/weather/local/94704](#) - 192k - [Cached](#) - [More from this site](#)
- Berkeley Weather Forecast and Conditions California (94707)**
Berkeley weather forecast and weather conditions for 94707. ... Parks in My Area. Nearby Intersections. Event Venues Near Me. Ski Areas Near Me ...
[www.weather.com/weather/local/94707](#) - 192k - [Cached](#) - [More from this site](#)

Query Suggestions in Ask

Ask.com Web | Images | City | News | More >

Advanced

Narrow Your Search

- [Weather in Berkeley, CA](#)
- [Berkeley, CA Forecast](#)
- [Current Weather in Berkeley, CA](#)
- [Climate in Berkeley, CA](#)
- [Berkeley, CA Detailed Weather Report](#)
- [Weather in Berkeley Springs, WV](#)
- [Average Weather in Berkeley](#)
- [Map of Berkeley California](#)

Expand Your Search

- [Weather in Emeryville](#)
- [Weather in Vigo](#)
- [Weather in Oakland](#)

More >

weather in berkeley Showing 1-10 of 1,339,000 MyStuff Options

Weather in Berkeley, CA | Save °F | °C

59° F | C

Morning clouds. Today's High: **71° F**
Cool. Today's Low: **58° F**

[Detailed Weather Report](#) | [7 Day Forecast](#) | [Seasonal Weather](#)

Current weather in

Current weather for a different location:

[Ad: Sponsored Results] [Find Lawyers in Your Area](#)
Client/Lawyer Matching Service. We Match You to the Right Lawyer.
[www.LegalMatch.com](#)

The Weather Channel - Berkeley, CA (94720)
Berkeley weather forecast and weather conditions for 94720. Today's Berkeley California weather plus a 36 hour forecast and Doppler radar from ...
[www.weather.com/weather/local/94720](#)

Local Weather Forecast for Berkeley, CA (94702) - weather.com
Local Weather Forecast for Berkeley, CA (94702). Today's weather plus a 36 hour forecast and doppler radar.
[www.weather.com/weather/local/94702](#) - [Cached](#)
[More Results from www.weather.com](#)

Maps
Map of Berkeley, CA 94701

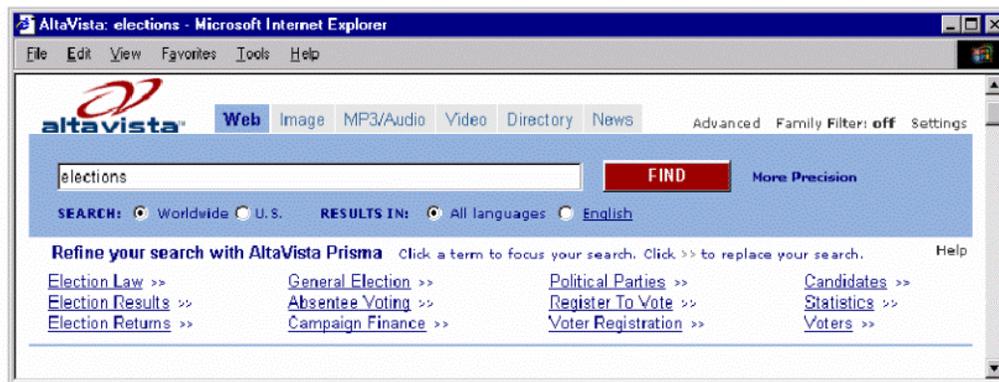
More Matches and Info

Current Time
Berkeley, CA
09:44:01 AM PDT
Monday, 16 July 2007

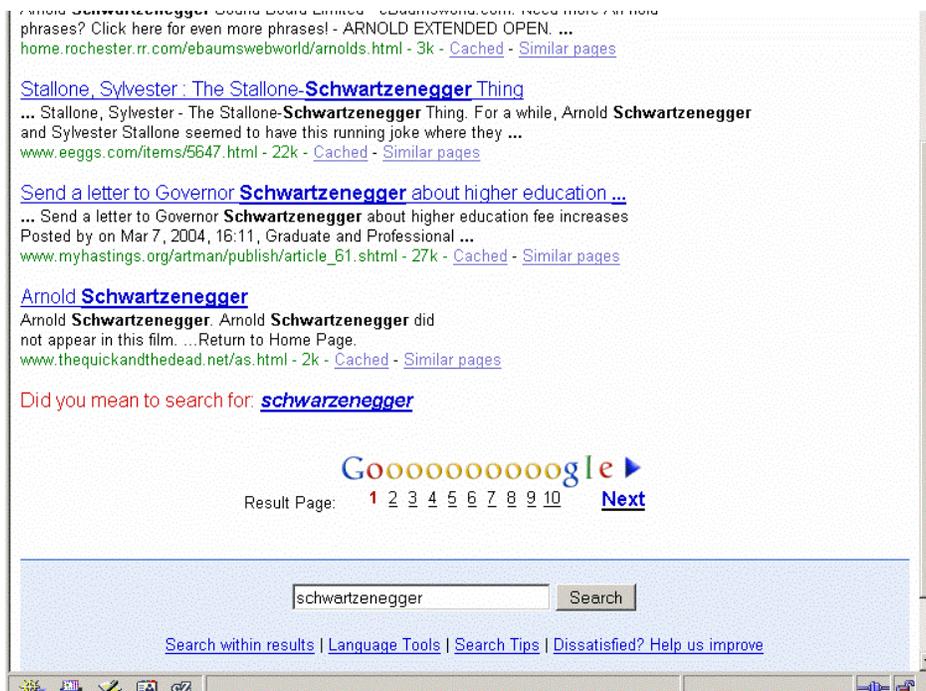
News
County road proposal the wrong solution
Island Packet
11 hours ago
More >

Images

Query Suggestions in AltaVista



Google Presents a Spelling Correction



DWIM

"Do What I Mean" mechanisms try to be "smart" and determine the searcher's unstated intentions or goals

Examples:

- Automatically suggest spelling corrections
- Automatically augment my query with related terms, synonyms, abbreviations, etc.
- Pop up "the paperclip" that tells me what kind of help I need

CRITICAL POINT: Users love DWIM when it works, but DESPISE it when it doesn't

Best Practices in Results Presentation

Present ranked results (people won't look past the first page) but don't show ranks

Sort of search results according to important criteria (date, author)

Group results according to well-organized category labels (see Flamenco)

Highlight query terms

Present query terms in context

Counter-intuitive failure to help: visualization

Search Query Term Highlighting

TIP

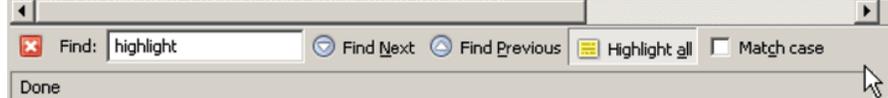
Firefox's Find bar can **highlight** all occurrences of the find text in the document if you click the **Highlight All** button.

NOTE

The Firefox Find bar—or, as it's sometimes called, the *Find toolbar*—has a number of controls. From the left they include an area in which to type characters to look for, a Find Next button, a Find Previous button, a **Highlight All** button, a Match Case button, and a message area.

Firefox always **highlights** the first occurrence of the term typed. Clicking the **Highlight** button tells Firefox to **highlight** all occurrences of the search term found on the page. Pressing F3 or clicking Find Next takes you to the next occurrence of the find text.

Using the Find bar's Find area, you can type a word(s). As you type, Firefox searches for what you type, finding and **highlighting** the first occurrence. As you type more letters, the search moves to the next match. For example, I typed **s**, and Firefox found the first **s**. It



Search Query Term in Context

A screenshot of a Google search results page. The search bar contains the text "how to prevent cheese from molding". The search results show "Web Books" and "Results 1 - 10 of about 175,000 for how to prevent". The first result is "Book results for how to prevent cheese from molding" with two sub-results: "Food Science - by Norman N. Potter, Joseph H. Hotchkiss - 608 pages" and "Extraordinary Uses for Ordinary Things - by Reader's Digest Association - 400 pages". The second result is "Sargento.com | FAQs" with a snippet: "Mold can develop on cheese once the product is exposed to air. ... packaging is not 100 percent airtight and does not always prevent mold development. ... www.sargentocheese.com/aboutus/faq.jsp - 26k - Cached - Similar pages". The third result is "A Forest Ranger's Cookbook - Household Suggestions" with a snippet: "To prevent cheese from molding, wrap in a cloth wrung out of vinegar. Then roll in paper. In cooking vegetables: Cover those that grow under the ground. ... forestry.about.com/cs/foresthstory1/a/camp_reci_tips.htm - 26k - Cached - Similar pages". The fourth result is "Preventing Moldy Cheese" with a snippet: "It's the air that makes the mold on cheese so keeping air from getting at ... In the bowl I add a little corn starch which will prevent it from sticking. ... www.stretcher.com/stories/981123b.cfm - 42k - Cached - Similar pages". The fifth result is "How to Prevent Cheese Mold | eHow.com" with a snippet: "How to Prevent Cheese Mold. It is frustrating to go into the refrigerator to get cheese for a recipe or sandwich and find that it has gone green with mold. ... www.ehow.com/how_2043886_prevent-cheese-mold.html - 49k - Cached - Similar pages".

Grouping of Search Results

Interviews with lay users often reveal a desire for better organization of retrieval results

Useful for suggesting where to look next

Variety of techniques - categories vs clusters, single vs complex (faceted) category structure

Comparing the Techniques -- Clustering

Clustering is an automated technique for assigning results to groups (exclusively)

More flexible than pre-defined categories

Disambiguates ambiguous terms

Automatically generated labels can be unintuitive and occur at different levels of description

Potentially useful if the user wants a summary of the main themes in the subcollection

Potentially harmful if the user is interested in less dominant themes

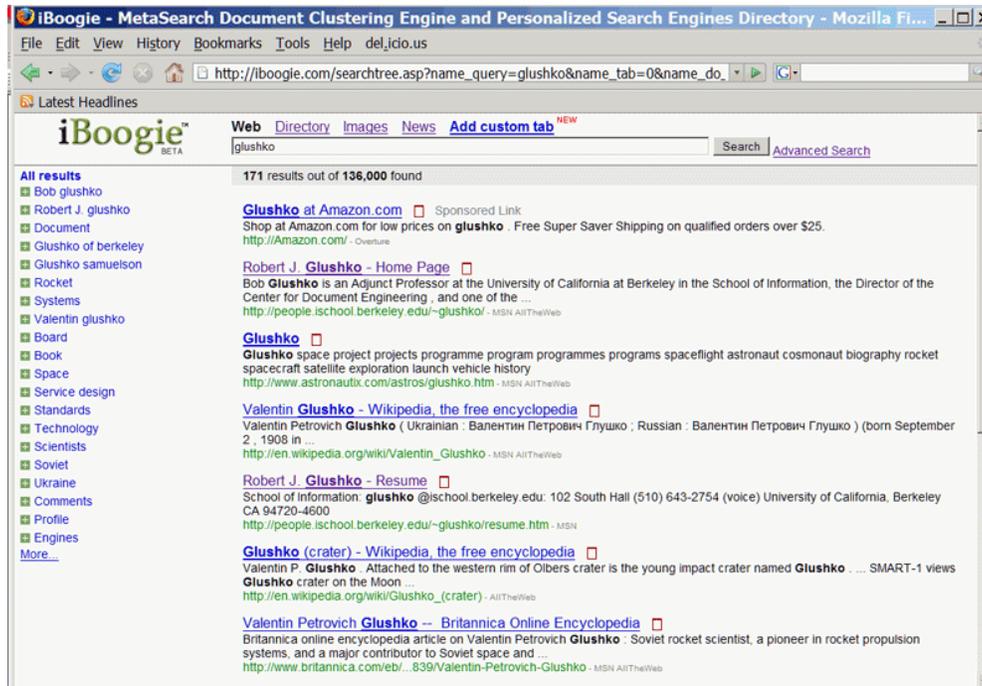
Results Clustering by Clusty.com

The screenshot shows the Clusty Search interface in a Mozilla Firefox browser window. The search query is 'glushko'. The page displays 'Top 173 results of at least 19,300 retrieved for the query glushko'. On the left, there is a 'clusters' sidebar with 'All Results (174)' and a list of clusters including 'Berkeley, University of California (34)', 'Document Engineering (28)', 'XML (18)', 'Samuelson, Intellectual Property (14)', 'Russia (11)', 'Image, Glushko crater (11)', 'Glushko, V. P. (11)', 'Tennis, Julia Glushko (9)', 'Pioneer, Rocket (3)', and 'Korolev (3)'. The main content area shows 'Top Shopping Results' for 'Document Engineering' at \$30.74, followed by 'Glushko at Amazon.com' with a sponsored link. Below that, there are four search results: 1. 'Glushko' with a description of the space project; 2. 'Valentin Glushko' with a biographical snippet; 3. 'Home - Glushko-Samuelson Intellectual Property Law Clinic' with a description of the law clinic; and 4. 'Robert J. Glushko - Home Page' with a description of his role at the University of California.

Results Clustering by Vivisimo.com

The screenshot shows the Vivisimo Velocity search interface in a Mozilla Firefox browser window. The search query is 'glushko'. The page displays 'Clustered Results' for 'glushko (171)'. A prominent cluster is 'University of California' containing 16 documents. The sidebar on the left shows a hierarchical view of clusters: 'glushko (171)' with sub-clusters like 'Document Engineering (28)', 'University of California (16)', 'Glushko is an Adjunct Professor at the University of California (9)', 'UC Berkeley (3)', 'Robert J. Glushko, Adjunct Professor (2)', 'Other Topics (3)', 'XML (18)', 'Glushko-Samuelson (14)', 'Intellectual Property (9)', 'Foundation, Rumelhart (5)', 'UC Berkeley (16)', 'Russian (9)', 'Moscow (8)', 'V.P. Glushko (9)', 'Recognized, Cognitive (9)', and 'Image (7)'. The main content area shows 'Sponsored Results for university of california' with links to 'University in California' and 'University Of California'. Below that, there are five search results: 1. 'IBM' with a link to a document about Bob Glushko; 2. 'Robert J. Glushko - Home Page' with a biographical snippet; 3. 'Robert J. Glushko - Home Page' with another biographical snippet; 4. 'Robert J. Glushko - Resume' with contact information; and 5. 'Biography: Glushko, Robert' with a link to a biography page.

Results Clustering by iBoogie.com



Comparing the Techniques -- Categories

Human-created categories, but items can often be automatically assigned (to multiple categories)

Usually restricted to a fixed set

Intended to be readily understandable to those who know the underlying domain

Provide a novice with a conceptual structure

Results Categorization by Google

Vitamin A - Google Search - Mozilla Firefox
File Edit View History Bookmarks Tools Help del.icio.us
http://www.google.com/search?q=Vitamin+A&ie=utf-8&oe=utf-8&...
Latest Headlines
Web Images Video News Maps Gmail more | bob.glushko@gmail.com | My Not...

Google Vitamin A Search Advanced Search Preferences

Web News Personalized Results 1 - 10 of about 56,500,000

Refine results for **Vitamin A**:
[Drug uses](#) [Interactions](#) [For patients](#) [From medical authorities](#)
[Side effects](#) [Warnings/recalls](#) [For health professionals](#)

Vitamin A - Wikipedia, the free encyclopedia
Vitamin A is an essential human nutrient. It exists not as a single compound, but in several forms. In foods of animal origin, the major form of **vitamin A** ...
en.wikipedia.org/wiki/Vitamin_A - 41k - [Cached](#) - [Similar pages](#) - [Note this](#)

Dietary Supplement Fact Sheet: Vitamin A and Carotenoids
Extensive information about the fat soluble **vitamin** including suggested RDA intake, role in human body functions, food sources, and deficiency signs.
ods.od.nih.gov/factsheets/vitamina.asp - 82k - [Cached](#) - [Similar pages](#) - [Note this](#)

Vitamin A
Discussion of function, deficiency, disease prevention, disease treatment, food sources, supplements, new research, and recommendations from the Linus ...
lpi.oregonstate.edu/infocenter/vitamins/vitaminA/ - 60k - [Cached](#) - [Similar pages](#) - [Note this](#)

Results Categorization by Google [2]

Vitamin A more:drug_uses - Google Search - Mozilla Firefox
File Edit View History Bookmarks Tools Help del.icio.us
http://www.google.com/search?hl=en&client=firefox-a&rls=org.mozilla:en-US:official&hs=V5g&pwst=1&q=Vitamin+...
Latest Headlines
Web Images Video News Maps Gmail more | bc

Google Vitamin A more:drug_uses Search Advanced Search Preferences

Web Personalized Results 1

Refine results for **Vitamin A**:
[Drug uses](#) [Interactions](#) [For patients](#) [From medical authorities](#)
[Side effects](#) [Warnings/recalls](#) [For health professionals](#)

Aquasol A (Vitamin A) drug indications and dosage - prescription ...
Learn the indications and **dosage** for Aquasol A (Vitamin A) and other ... **Vitamin A** injection is effective for the treatment of **vitamin A** deficiency ...
www.nlm.nih.gov/cgi/pt/medlineplus/druginfo/natural/patient-vitamina.html - 45k - [Cached](#) - [Similar pages](#) - [Note this](#)
Labeled by [WebMD](#) [MLA](#) [HON](#)

MedlinePlus Herbs and Supplements: Vitamin A (Retinol)
The World Health Organization (WHO) has established **dosage** guidelines for children between 6-11 months-old to receive 100000 IU of **vitamin A**. This increases ...
www.nlm.nih.gov/cgi/pt/medlineplus/druginfo/natural/patient-vitamina.html - 45k - [Cached](#) - [Similar pages](#) - [Note this](#)
Labeled by [HON](#) [CDC](#)

VITAMIN A - ORAL (Aquasol A, Palmitate-A) side effects, medical ...
Avoid taking cholestyramine or mineral oil at the same time as **vitamin A** because they can prevent absorption of **vitamin A**. Separate the dosing by at least 2 ...
www.medicinenet.com/vitamin_a-oral/article.htm - 41k - [Cached](#) - [Similar pages](#) - [Note this](#)
Labeled by [HON](#)

Drugs and Treatments - Vitamin D Oral - Patient Handout from WebMD
Vitamin D is used to treat and prevent bone disorders caused by low levels of ... If your doctor has prescribed this medication, the **dosage** is based on your ...
www.webmd.com/drugs/drug-6414-Vitamin+D+Oral.aspx?drugid=6414&drugname=Vitamin+D+Oral - 87k - [Cached](#) - [Similar pages](#) - [Note this](#)
Labeled by [HON](#)

Results Organized Using Faceted Categories (Flamenco)

Flamenco

Refine your search further within these categories: These terms define your current search. Click the  to remove a term.

Media (group results)
costume (3), drawing (2), lithograph (1), woodcut (6), woven object (2)

Location: all > Asia
Afghanistan (1), China (4), China or Tibet? (3), India (2), Japan (13), Russia (1), Turkey (3), Turkmenistan (1)

Date (group results)
17th century (3), 18th century (3), 19th century (10), 20th century (3), date ranges spanning multiple centuries (7), date unknown (2)

Themes (group results)
music, writing, and sport (5), nautical (1), religion (2)

Objects (group results)
clothing (5), food (1), furnishings (4), timepieces (1)

Nature (group results)
bodies of water (3), fish (1), flowers (2), geological formations (1), heavens (3), invertebrates and arthropods (1), mammals (2), plant material (3), trees (1)

Places and Spaces (group results)
bridges (1), buildings (1), dwellings (1)

Location: Asia  start a new search

Shapes, Colors, and Materials: fabrics 

all items within current results

28 Items (grouped by location) view ungrouped items

Afghanistan 1



China 4



Embroidery
no artist
19th century



Embroidery
no artist
19th century



Embroidery ;
no artist
19th century

Best Practices in Query Reformulation

(Do what works in query specification within the context of current results)

Make it easy to conduct iterative search by modifying queries to search within the current results

Get relevance feedback from searcher ("more like this")

Not all Suggested Refinements Work

Refinement category	Examples (query / refinement)	Refinement type	Percent frequency of use as refinement	Percent frequency of use for new search
Head	triassic / triassic period			
Modifier	buckets wholesale / plastic buckets		15	12
Elaboration	jackson pollack / museum of modern art		25	10
Location	vietnam / ho chi minh city		4	5
Alternative	job listings / job openings		12	30
Hyponym	birds of prey / falcons		5	0
Morphological variant	norse myth / norse myths		3	2
Syntactic variant	map of sudan / sudan map		4	2
Acronym	usa maps / united states of america		2	0
Spelling	stationary catalog / stationery		4	0
Change	skateboards / mountainboards		2	12

Query Refinement Based on Relevance Feedback

Many studies show that if users engage in relevance feedback, the results are much better.

But the explicit effort required to rate relevance is usually a roadblock

This is one motivation for using "social" or indirect methods of assessing relevance

Readings for Lecture #22

Christopher D. Manning, Prabhakar Raghavan and Hinrich Schütze,
Introduction to Information Retrieval, Cambridge University Press. 2008.

- Chapter 1: Information retrieval using the Boolean model
- Chapter 2: The term vocabulary & postings lists