# Google Unleashed!

A University of Michigan Graduate Library Technology Workshop

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Introduction

Google is the most popular search engine on the web, and indexes a vast number of pages. Like all search engines, Google only indexes a fraction of what’s actually out there on the web. Unlike other search engines, Google is really good at finding what you actually want!

Google’s unique search algorithms were what initially put them ahead of their competitors. Their ongoing innovations have kept them ahead. In the next few pages, we’ll explore:

- things Google does that you might not know about
- how to make the functions that you do know about work better for you
- how people have adapted Google’s unique capabilities for their own nefarious, informative, and humorous purposes.

A Search Box Convention

Throughout this document searches will appear like this: [cats and cheese]. Punctuation inside the search box can have very important effects on the results of your search, so all punctuation inside the box should be entered as is!

What’s so great about Google?

Just like all other search engines, Google indexes the content of a webpage to figure out what the page is about. Most other search engines rank their results based on a page’s content: the top item on a results list is the item whose text seems to most closely resemble your search.

The basic thing that sets Google apart from other search tools is its PageRank technology. The top item on a Google results list is the item with the highest PageRank. Pages are assigned a rank based on the number of other pages Google knows about that link to them.

Links from pages with higher ranks count for more than links from pages with lower ranks. It’s all a popularity contest, really.

In the context of the Web, a popularity contest turns out to be a really good way to find things. It makes use of the human knowledge that is inherent in the linked structure of the Web; people link to your website when they find something on your site interesting or useful. Each outside link to your page is counted as a “vote” for your page. Sites with lots of votes can be considered to be more useful to other people, so votes from those popular sites count for more. Lots of votes from sites that themselves have lots of votes are sure to make your site rise in the Google rankings. Of course, Google counts many layers of “votes” in their page rank technology – it’s not just who voted for you, but who voted for them, and who voted for them, and so on.
Issues to consider…

Any for-profit company providing free services does usually want something from you in return. You should be aware that like most commercial websites, Google does track your search queries, which pages you visit, and so on. This is most obvious on search results pages, where Google generates advertising related to your search. It is wise to be aware of this when searching, but Google does not seem to associate the information about your behavior with personally identifiable information (though they may track your IP address.) Some other services that Google provides, like Gmail, or the Google Toolbar or Web accelerator - any that require registration, or that require that you install software on your computer - may well associate information about your behavior with information about who you are personally.

Google’s stated corporate philosophy is “Don’t Be Evil”, and many people feel they more than live up to this philosophy. However, as Google continues to extend their services, other individuals have raised concerns about their business practices and content ownership. Both pro- and anti-Google discussions are available all over the web. Check out “News about Google” (p.15) for some sources.

Simple Searching

The standard Google search page is at http://www.google.com. You can enter words into the Search Box to begin searching right away.

Enter as many words as you want. You can put your search in the form of a question, such as [how do you do laundry], or a few keywords such as [mistletoe scotch tape]. By default, Google searches for pages that contain all the words that you enter.

The I’m Feeling Lucky button is Google’s first hide-in-plain-sight feature – few people actually know what it does. It bypasses the results list, and takes you directly to the webpage that would have been at the top of the list.
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Interpreting Search Results

Search Headers

Every set of search results has a header, as pictured below. It gives you general feedback, such as what your search query was, how many results it got, how long the search took, where it searched, and options for revision.

![Search Result Headers](image)

Standard Results

Each individual result consists of a blue Result link, a short snippet of page content in black text (with your search words in bold), and green text that shows the full address of the page. There may be a link to translate the results page. Indented results are usually secondary pages closely related to the non-indented result directly above.

```
20/11/2004 -- Climate change puts skiing at risk
... Potal. Climate change puts skiing at risk Source: Copyright 2004, Telegraph
Date: November &nbsp; 20 &nbsp; 2004 Byline: Peter Hardy ...
www.waterconserve.info/articles/reader.asp?linkid=36586 - 13k - Cached - Similar pages
```

Most result listings also show a pale blue Cached link, which takes you to a copy of that page that Google stored when it last accessed the page. This can be particularly useful for pages that become unavailable or have changed since your original access date. The other pale blue Similar Pages link finds pages that are similar to the search result – useful if you find one page that is very relevant among many that are not so relevant.

“Sponsored Links”

Google has stated several commitments about advertising. They do not accept money for placement in search results. They offer advertising only when it is relevant to the interests of users. Any advertisements they do show are text-only, not distracting pictures. They have made good on these commitments, but it is good to be aware that some of Google’s business model depends on being able to sell advertising space.

Some Google results contain out-and-out ads, in the form of Sponsored Links – these appear only when Google thinks your interests might match up with some of their ads, and are always marked as such. Other results will contain Product Results, which are not exactly advertising. Product Results appear only when Google thinks you might have been looking for a product for sale. They link to results from Google’s online shopping tool, Froogle, or from websites selling products. You may do many searches that result in no advertising at all, but other searches may bring up quite a bit.
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The example search at right, for [mp3 player], retrieved Sponsored Links, Product Results, and regular search results.

**Did you mean?**

If you enter a search query that is misspelled, Google may offer some alternatives to your spelling. While the “Did you mean:” feature is very useful, it does not catch all spelling mistakes, especially those which are common enough to appear repeatedly on the web!

**No Results**

If your search does not match any pages it will inform you that there were no results, and sometimes offer “Did you mean:” suggestions. In the example below, the “Did you mean:” suggestion also returns no results!

**Paging through results**

At the bottom of your results page, you’ll see tools for moving through your search results. By default, there are only listings for 10 pages of results at a time, though most searches return many more than 10 pages of results.

Use the Previous and Next links to navigate forward and backward through the pages, or click on a page number to jump to that page. Note that the blue “G” at the beginning of Gooooooooolge works the same as the Previous button, the “gle” at the end works as the Next button, and the yellow “o” above a number works the same as clicking on that number.
Phrase Searching

When you input a series of words, Google always treats them as separate words, but it will guess at common phrases. You can force Google to search for words together by putting quotes around them.

In the example above, "mistletoe scotch tape" returns many pages with the phrase “scotch tape” on them, but also many pages where the three words appear separately. To get only pages where the phrase “scotch tape” appears along with the word mistletoe, you’d input “mistletoe “scotch tape”.

Stop words

Google has many stop words and stop phrases - words that are so common that it prefers not to search for them. Examples include “the”, “an”, “of”, and “how do you”. When Google throws words or phrases out of your search, it may or may not tell you that it has done so. Most likely, you will simply see that some of your search words are not highlighted below your search box – these words were dropped out of the search.

1 - Stop words indicated - February 2005

2 - Stop words NOT indicated - June 2005

Requiring or excluding words

You can force Google to search a word or phrase by placing a plus sign before the word or before a phrase in quotes. You might choose to enter this search as "how do you do laundry", or +how do you do laundry. In the first case, it searches for the whole phrase; in the second it requires that the word “how” appear on result pages, and then allows Google to make its own decisions about the rest of the words (functionally, Google then searches for the words “how” and “laundry.”)

You can also use the minus sign to exclude words or phrases from your search. The search disney biography returns many biographies of Walt Disney, but few from other folks.

disney biography –walt –walter brings back a much wider variety of results.
Boolean searching

Traditional Boolean searching works in Google for both individual words and “phrases in quotes”. Parentheses can be used to group Boolean operators. The **AND** and **OR** operators are available, but the **NOT** operator is not used. Use the **minus sign** instead of a Boolean not.

**Examples:**
- **cats AND dogs** Pages with both words.
- **cats OR dogs** Pages with one or the other or both words

**Advanced Search Page**

The **Advanced Search Page** can be reached by clicking “Advanced Search” from the Google home page. Use the pulldown menus to build complex searches, to search for specific languages, dates, file formats, and much more.

**Advanced Search Operators**

Similar functionality is available from the standard Google search page, using **Advanced Search Operators**. These are simple codes and symbols that allow you to build more complex searches. The plus and minus sign symbols are examples of Advanced Search Operators – see the next page for a more comprehensive list.

**Note:** There are some searches that can be done with Advanced Search Operators that **cannot** be done from the Advanced Search page, and vice versa.
Search Refinement Operators:

~cats ~dogs  Pages with the search words and/or terms Google thinks are related.
(to find out what terms Google thinks are related, search for synonyms but exclude
the original word, e.g.: ~word –word).

cats * dogs  Pages where the two words are separated by exactly one other word

URL-related Operators:

link:www.umich.edu  Pages that link to www.umich.edu
info:www.umich.edu  Information about the page www.umich.edu
cache:www.umich.edu  Google’s cached copy of www.umich.edu
related:www.umich.edu  Pages that Google thinks are related to www.umich.edu

Location-Specific Operators:

KNC site:www.umich.edu  The word “KNC” on pages in the umich.edu domain
intitle:faculty  The word “faculty” in the Title* of a page. Only works on
the one word immediately after the operator.
allintitle:faculty exploratory  All words after this operator in the Title of a page
inurl:faculty  The word “faculty” in the URL** of a page. Like intitle:,
works on only one word at a time.
allinurl:faculty exploratory  All words after this operator in the URL of a page

Numeric Operators

cats 20…60  Pages with the word “cats” along with numbers in the specified range.

There are more details about all Advanced Search features on Google’s Help Center, at
http://www.google.com/help/index.html

*A page’s Title is the words that appear at the very top of your browser window.

** A URL (Uniform Resource Locator) is the address of a webpage – shown in the white bar directly above the page.

At left, the Title is “University of Michigan University Library” and the URL is http://www.lib.umich.edu/
User Preferences

Anywhere on Google that you see the Preferences link, you can click to adjust your personal settings for Google. Preferences are set for your browser, and do involve cookies, so you must be willing to accept cookies for the preferences to stay set.

On the Preferences page (http://www.google.com/preferences) you can set your interface language, choose the desired language for your results, determine how many results should be shown per page, and decide whether to open search results pages in a new window. You can also choose the level of SafeSearch filtering (SafeSearch allows you to exclude explicit content. By default, filtering is on for image searches, and off for text searches). Prefix individual searches with safesearch: to filter on a search-by-search basis.

General Search Tips

Things to keep in mind whenever you’re searching the web…

Keep It Simple, Searcher!

Because Google is so good at finding “popular” pages, sometimes the results from a simpler search may actually be more useful.

Specific example: If your goal really is to get instructions on doing laundry, the simple search [how do you do laundry] actually brings back more immediately useful results than the more heavily specified searches, “how do you do laundry” or +"how do you" “do laundry”.

Build your search backwards

The web is a lot more heterogeneous than most searchable databases. Pages are created by a wide range of authors, for an even wider range of audiences.

Imagine the perfect search result, and work backwards from there. Think about who would have created it, and for what purpose. Then try think of the words or phrases that your imaginary perfect-page-creator would have used to describe the concept.

Specific example: (change your search to match the hoped-for results)
A searcher who works in a disability-rights advocacy group may be used to language such as people with disabilities. This language, used in a search, is likely to get results from similarly consciousness-raised authors. However, if the search goal is to find pages by lay authors that mention disabilities, the searcher might want to consider less progressive language such as disabled or handicapped.

Specific example: (adapting for the searcher)
You might try electron micrographs to find info for an adult about electron micrographs (images taken by massively magnifying electron microscopes). However, magnified images is a better search if you’re helping an elementary-school student with her homework.
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Throw Away Your…

…Dictionary

Enter a word or phrase prefixed by define: to find web-based definitions.

![Google search bar with define: sodium laurel sulfate](image)

Web

Definitions of sodium laurel sulfate on the Web:

- sodium laurel sulphate: a caustic detergent useful for removing grease; although commonly included in personal care items (shampoos and toothpastes etc.) it can irritate skin and should not be swallowed.
- [www.google.com/search?q=sodium%20laurel%20sulfate](http://www.google.com/search?q=sodium%20laurel%20sulfate)

…Calculator

Enter calculations to get the answer. Allows you to use parentheses, exponents, factorials, non-base-10 numbers, and many more undocumented functions. Details are available at [http://www.google.com/help/calculator.html](http://www.google.com/help/calculator.html)

Enter calculations from the simple to the complex; e.g., \(6^3\) or \((256 + 3) \times (29/2)^3\):

- \(6 * 3 = 18\)
- \((256 + 3) \times ((29 / 2)^3) = 789,593,875\)

…Weights and Measures Conversion Tables

This is technically part of the calculator function, but deserves mention on its own. Enter a conversion such as [4 cups in teaspoons](http://www.google.com/search?q=4%20cups%20in%20teaspoons) or [124 km in mi](http://www.google.com/search?q=124%20km%20in%20mi) to find the converted amount.

- **4 US cups = 192 US teaspoons**
- **124 kilometers = 77.0500278 mi**

…Phone Book

Enter a ten-digit phone number, and Google gives you the corresponding address. Enter a first name, last name, city, state, and/or zip code (e.g. [sam, smith, 48103](http://www.google.com/search?q=sam%20smith%2048103)), and get the phone number and address. Entering a proper street address will take you to Google Maps.

You can remove your personal listing from the Google phonebook through the form at [http://www.google.com/help/pbremoval.html](http://www.google.com/help/pbremoval.html)

And much more!

You can also enter UPS, FedEx, and USPS tracking numbers, Vehicle ID (VIN) Numbers, UPC codes, Telephone area codes, Patent numbers, FAA airplane registration numbers, airline flight numbers, and stock ticker symbols. Enter the name of a movie and a zip code, for showtimes in your area. Experiment on your own to see what else you can ask about!
Other Types of Google Searches

Google Images – images.google.com

Google Image Search finds image files that appear on public web pages. It can be really useful, but keep in mind, though the images it indexes are publicly-accessible, they’re not public domain! Each image found through Google Image Search belongs to the owner of the page where the image appears.

The Image Search box looks just like the one on the standard search page. Most of the standard simple search options, including phrase searching and the plus and minus sign operators, can be used. Image Search finds images based on words in the filename for the pictures, and words on the page where the picture appears. Google’s PageRank system is also applied to images, though in less clear ways than in text search results.

By default, Image Search uses a Google’s SafeSearch filter to remove explicit images from your search results. You can change the SafeSearch settings by clicking on the “Moderate SafeSearch is on” link in the header of your Image Search results, or anywhere on Google that you see the Preferences link.

Google Print – print.google.com

Google Print is a project that aims to put the content of books online. Right now, results are available from information submitted by publishers. They’re also slowly adding content from several major libraries, including the University of Michigan Library.

You can search for books directly at the above URL. From the standard Google search box, if your search query matches results in one of the Google Print books, there may be a Print Results link in your results list. You can force Google to search inside books from the standard search box by looking for “books about” your topic. Results for “books about navigation” are shown above.
Google Scholar – scholar.google.com

Google Scholar is a relatively new addition to the Google family, but a particularly useful one for academic searchers. It searches publicly available web content, but focuses specifically on academic sites and peer-reviewed content.

Results are weighted by PageRank, but also by rates of citation and other more traditional bibliometrics. You can click on the “Cited by #” link in the search results to see what other articles have cited that article.

If you see the text “Availability at UMichigan”, you can click to perform a quick automatic search of our library's holdings, using the SFX function.

Google Maps - maps.google.com/

This is a new feature, and provides similar functions to many other map sites. The Google Maps graphical interface is really outstanding. It pans and zooms very smoothly, and can place “pins” on the maps in locations that you specify. In many large metropolitan areas, you can switch back and forth between a map view and a satellite photograph view.

Google Local - local.google.com/

Closely related to Google Maps, Google Local lets you search for products and services near a given address in the U.S. or Canada. It combines Yellow Pages data with web page data to provide results, which are also placed on a map of the area in question.

Local results are displayed in order of relevance, with the PageRank algorithm coming into play again. It won’t always display the closest option first, but rather the option that it believes will best meet your stated needs.
Froogle - froogle.google.com/

Froogle is a new twist on shopping online. Merchants can upload their product catalogs to Froogle, but they cannot pay for placement in results.

You can search across multiple merchants at once, and even compare products in “Grid View”. In addition to searching uploaded catalogs, Froogle also searches web pages that look like they’re selling a product.

Google News - news.google.com

Google News provides a gateway page to many online news sources. Like many other similar sites, you can browse news in various categories. Of course, since it’s a Google product, you can also search for news stories, and sort results by relevance or date. The Advanced News Search page lets you search for stories in a particular publication, or published in a particular geographic area, or by date.

Google Groups - groups-beta.google.com

Google Groups is a free service that lets groups of people create groups to communicate with one another via email and the Web. But it also provides access to Usenet, a decentralized world-wide system of (usually Unix-based, usually Internet-accessible) discussion groups (newsgroups). Google does not own or run Usenet, but it does own a massive archive of Usenet messages. You can post to Usenet through Google Groups, read posts, and you can search the archive (which goes back to 1981.) To create a group or post to a group, you need to create a free Google account, but the archive can be searched freely without logging in.
Google Directory – directory.google.com

The Google Directory is based on the Open Directory Project, in which volunteer (human) editors assign web pages to particular categories. It can be a great tool when you’re exploring a topic for the first time, trying to learn about relationships between topics, or if you’re looking for human-vetted information on a topic. Again, the Google Directory distinguishes itself from other web directories by pushing results with higher PageRanks to the top of the directory lists, which usually makes it easier to find relevant materials.

Special Searches

Search government sites - http://www.google.com/unclesam
Apple Macintosh sites - http://www.google.com/mac
Microsoft sites - http://www.google.com/microsoft
Linux sites - http://www.google.com/linux
BSD sites - http://www.google.com/bsd

University Search

Google provides free, customizable web search tools to educational institutions. Searches can be restricted to your web domain, and results can be customized to look like the rest of your site. The University of Michigan homepage at http://www.umich.edu, and the University of Michigan Libraries homepage at http://www.lib.umich.edu, both use this service to search within their websites. Although the results looks just like the rest of the University Library site, you can tell from the URL that the actual address is at Google.

More information is available at http://www.google.com/options/universities.html

Google Zeitgeist is an official “publication” of Google, Inc. It tells you what searches are currently popular on Google, which are gaining ground, and which are declining. It’s a very good snapshot of public interests.

Google Labs – [labs.google.com](http://labs.google.com)

Google Labs is where Google test-runs its ideas. Unlike Betas (which are officially supported “trial runs” of new ideas), the applications in Google Labs are constantly changing. Always a fun place to go to see what’s in development!

Google Logos

Google frequently changes its logo, for any and all occasions. Whenever there is an unusual logo on the Google homepage, you can click the logo to perform a search that will tell you what the logo is in honor of – past examples include:

Venus Transit - June 8, 2004

One of many for the 2004 Summer Olympics

November 2, 2004

See past special logos at [http://www.google.com/holidaylogos.html](http://www.google.com/holidaylogos.html)
The following sites make use of the Google API (application programming interface) service, which allows programmers to write their own code that accesses the Google servers. It’s free to anyone who wants to download the development kit, and developers have to register with Google. *None of these sites/concepts are officially sponsored by Google.*

**GoogleFight/GoogleBattle** - [www.googlefight.com](http://www.googlefight.com), [www.googlebattle.com](http://www.googlebattle.com)

These fun little sites allow you to enter two search terms, and determines the “winner” by which term has more Google hits. Classic matches include “me” vs. “myself”, “pen” vs. “sword” and so on.

**Google Bombs**

Google considers that the text of links to a site in some way describe the site, so you can influence search results by getting lots of sites to link to one place using an unusual text link. If lots of pages used “peanut butter” to link to the Umich home page, then the Umich home page would show up unexpectedly high in the results of searches for “peanut butter”. The practice of intentionally skewing search results by linking to a page via an unusual text link is called **Googlebombing**, and the text that is linked-on becomes a **Googlebomb**.

One of the very early Googlebombs was “miserable failure” linked to the White House biography of President George W. Bush. A backlash has occurred linking the same words to Jimmy Carter’s White House biography. They are now results numbers one and two for the search **miserable failure**.

Despite the distortion of search results that GoogleBombs create, Google has said that since its search results simply reflect public opinion, and the Bombs tend to fade over time, it will not attempt to prevent Googlebombing. Web administrators can prevent their site from being used to launch a Googlebomb, but there doesn’t seem to be a way for individuals to prevent their own page from being bombed. Known bombs are tracked on [http://blog.outer-court.com/googlebomb/](http://blog.outer-court.com/googlebomb/).

**Montage-a-Google** - [http://grant.robinson.name/projects/montage-a-google/](http://grant.robinson.name/projects/montage-a-google/)

One of the few major uses of the Google Images API: an elegant Flash program that performs a Google Image search for you, then generates a mosaic-like patchwork of images from your search. The same programmer has created “Guess-the-Google”, where you see a patchwork of images, and attempt to guess the keywords that generated that patchwork ([http://grant.robinson.name/projects/guess-the-google/](http://grant.robinson.name/projects/guess-the-google/)).
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Google Maps APIs

Even before Google released its official Google Maps API, people were coming out with hacks that used the system to do unexpected things.

http://www.celebrity-maps.com/ - Uses Google Maps to show you residences and businesses of celebrities.

http://www.housingmaps.com/ - uses Google Maps plus Craigslist housing data to provide a detailed interactive map of available real estate.


http://www.gmap-pedometer.com/ - lets you point-and-click to define a walking/running/biking/driving route and tells you the distance. Similar technologies are being used to build collections of good routes in particular areas.

For news about Google Maps APIs, try http://googlemapsmania.blogspot.com/

News about Google

Various blogs and news sites keep track of things going on with Google.

There is an official Google-sponsored Blog at http://googleblog.blogspot.com/.

Google Watch (http://www.google-watch.org/) and Google Weblog (http://google.blogspace.com/) are rather biased anti-Google sites that sometimes raise some interesting questions.

Google Blogoscooped (http://blog.outer-court.com/) and Google News forums on Webmaster World (http://www.webmasterworld.com/forum30/) are better for less biased news reports.

Slashdot reports about a wide variety of technology news, often including Google news (http://www.slashdot.org). Other general technology news sites include CNet (http://www.news.com), ZDNet (http://www.zdnet.com), and Wired (http://www.wirednews.com/).