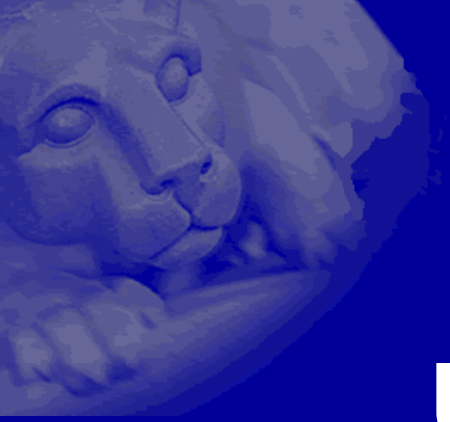

Using the Penn State Search Engine

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ITS Academic Services and Emerging Technologies

How Does Search Work?

In general search engines deploy a piece of software called a “crawler” which begins searching at a given URL or URLs and follows the links contained in one page to others.

There may be boundaries on this search ($e.g.$ only sites in this domain or only sites N levels deep in the current site).

Crawlers collect these pages and pass all or parts of it to a “catalog” or “index” of the site(s).

The index is passed to the actual search engine software where pages are ranked according to a numerical algorithm. Google’s numerical algorithm is called PageRank.

The usefulness of a crawler based search engine depends on all three of these parts.

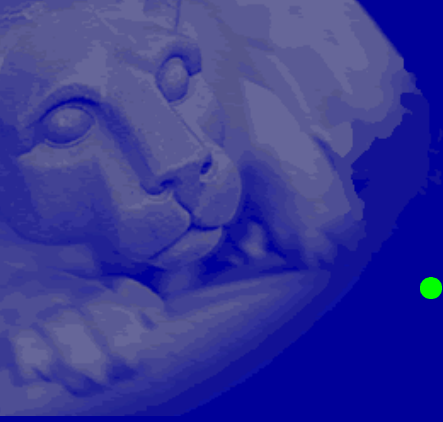
By the Numbers

From the last crawl (Wednesday evening, October 27, 2004):

- Time:
  - took 7 hours 34 min 20 sec to query the Web servers,
  - 2 hours 55 min 29 sec to build the index
  - and another 50 min and 49 sec to replicate and test the index
  - Start to finish: 11 hr 20 min 38 sec to crawl/index Penn State

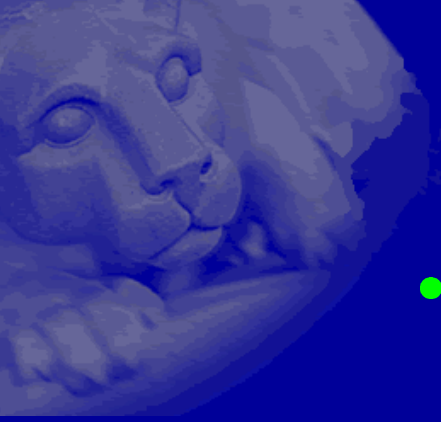
By the Numbers (cont'd)

- Amount:
  - 838,958 total URLs crawled/indexed
  - 466,077 URLs found that we excluded (non .psu.edu, containing ?, etc)
- Queries:
  - Total for September, 2004: 582,441
  - Average for September: 19,415/day
  - 1 every 5 seconds
  - about 1,200 in the time to give this seminar



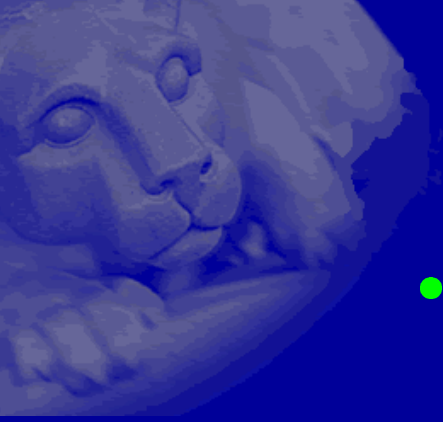
Why Search?

- **Navigational —** The immediate intent is to reach a particular site.



Why Search?

- **Navigational** — The immediate intent is to reach a particular site.
- **Informational** — The intent is to acquire some information assumed to be present on one or more pages.



Why Search?

- **Navigational** — The immediate intent is to reach a particular site.
- **Informational** — The intent is to acquire some information assumed to be present on one or more pages.
- **Transactional** — The intent is to perform some Web–mediated activity.

Does Google Engine Scale?

Look at the numbers:

- www.Google.com $\rightarrow \sim$4.3 Billion pages
- search.psu.edu $\rightarrow \sim$0.83 Million pages

Look at the connections:

- www.Google.com $\rightarrow$ relies heavily on connections of "important" pages to other "important" pages
- search.psu.edu $\rightarrow$ with the exception of some central pages, very few departmental pages actually link across academic or administrative boundaries.

What Really Matters?

Although Google's PageRank algorithm is a secret, the following is known:

- Links from other pages are heavily weighted
- <TITLE> content is very important
- Keyword density within a page is important
- Keyword–laden links vs. "click here"
- Meta keyword tags are not that important

Are Tags Irrelevant?

Under our current system:

- Meta keywords are not that heavily weighted
- Penn State sample differs from Google sample with regard to interconnections
- Use keywords in <TITLE> tags of page as well as “keyword laden” links to other pages within and outside of your site
- Remember Google is current state of the art; the future is probably a more federated search mechanism

Search Integration

Integrating the Penn State Search Engine Into Your Site

- Invoking

Search Integration

Integrating the Penn State Search Engine Into Your Site

- Invoking
- Restricting Search Results

Search Integration

Integrating the Penn State Search Engine Into Your Site

- Invoking
- Restricting Search Results
- Customizing Search Results Style * New Feature!

Invoking Search Engine

Invoking the Search Engine from Your Site

- Easy and convenient way for visitors to search from your site
- Directions:

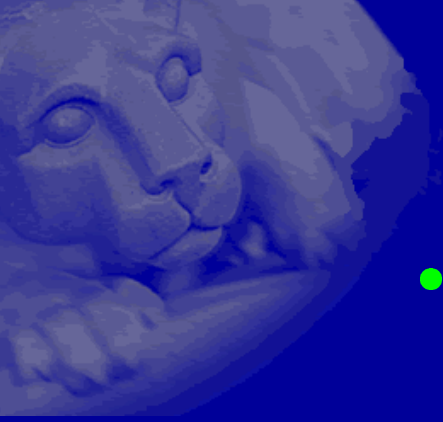
  <http://aset.its.psu.edu/googledocs/instructions.html#invoke>

Restricting Search Results

- as_sitesearch

Directions:

<http://aset.its.psu.edu/googledocs/instructions.html#restrict>

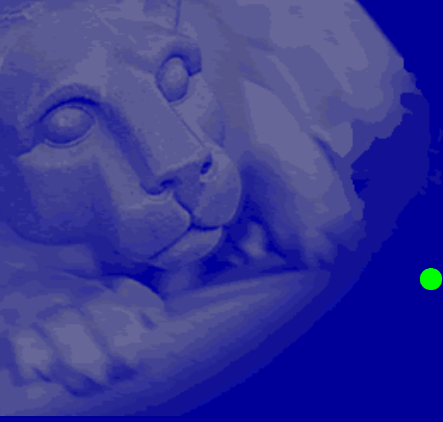


Restricting Search Results

- as_sitesearch — Restrict results to only URLs that begin with the value you set for this parameter. Adds “site:–your–url–” to the search query.
- sitesearch

Directions:

<http://aset.its.psu.edu/googledocs/instructions.html#restrict>

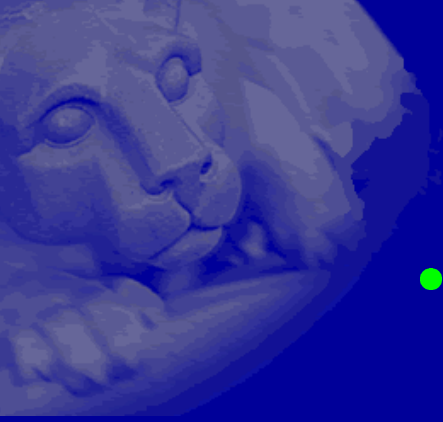


Restricting Search Results

- as_sitesearch — Restrict results to only URLs that begin with the value you set for this parameter. Adds “site:–your–url–” to the search query.
- sitesearch — Restrict results to only URLs that begin with the value you set for this parameter. Does not add “site:–your–url–”
- restrict

Directions:

<http://aset.its.psu.edu/googledocs/instructions.html#restrict>



Restricting Search Results

- as_sitesearch — Restrict results to only URLs that begin with the value you set for this parameter. Adds “site:–your–url–” to the search query.
- sitesearch — Restrict results to only URLs that begin with the value you set for this parameter. Does not add “site:–your–url–”
- restrict — Uses a subcollection which administrators must set up for you before a crawl. Allows multiple sites to be grouped together; takes a few days to take effect.

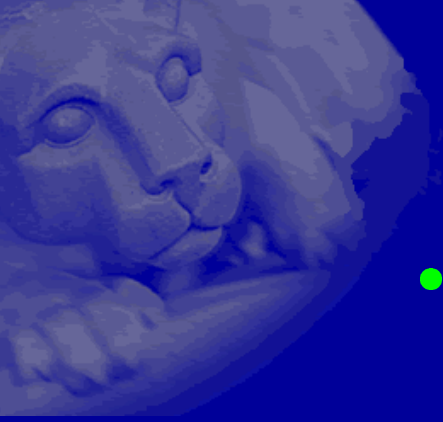
Directions:

<http://aset.its.psu.edu/googledocs/instructions.html#restrict>

Customize Format/Style

Customize Search Results Format/Style

- Two choices for alternate format: XML and XSLT.
- XML formatted results — good for dynamic applications
- XSLT — translate HTML into your desired format — good for Web visitors



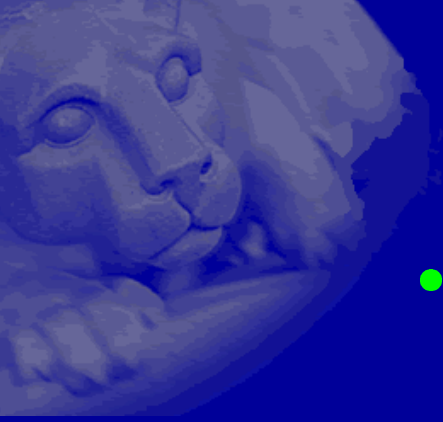
Using XML Results

- XML is the eXtensible Markup Language. It is a format containing data that can be easily passed between programs and systems.
- You can have a dynamic application query the search engine directly.
  - This application can do offline processing.
  - This application can serve as an intermediary between the Web visitor and the search engine. This allows you to provide your own formatting controls. – Downside: it requires some programming work.

Using XML Results (cont'd)

Directions on receiving XML:

<http://aset.its.psu.edu/googledocs/instructions.html#xml>



Customizing HTML results

- All search results begin in XML format. The Google Search Appliance “translates” them into another format, such as HTML.
- It uses Extensible Stylesheet Language Transformation (XSLT) documents to translate into a particular format or style. Use the proxystylesheet parameter to specify what XSLT you wish to use.
  - proxystylesheet=PennState means, use the XSLT for the collection called “PennState” which is the master index for our appliance.
  - proxystylesheet=<a URL> means, attempt to read an XSLT file at the address provided.

Customizing HTML results

Directions:

<http://aset.its.psu.edu/googledocs/instructions.html#format>

Self serve XSLT [NEW!]

The *NEW* Self serve XSLT file generator form.

- Basic knowledge of HTML required; knowledge of XSLT *not* required.
- You may design your site style in any program you wish (Dreamweaver, etc), and simply copy/paste the HTML into the Web form.

Generator URL with directions:

<http://aset.its.psu.edu/cgi-bin/googledocs_custom_xslt.cgi>

Final Notes

- Google Search Appliance Backup Strategy Proposal:

  <http://www.personal.psu.edu/staff/j/c/jcd/useless/google_backup_strategy/>

- Questions?