



# Image searching on the Internet/World-Wide Web.

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## Introduction

It is safe to say that we see images in our lives all the time. There are countless forms of images: vacation photos taken with film, X-rays from the doctor, or even the television set. What does image searching on the Internet embrace? Often a person wants to find a certain image on the Internet for a specific reason; perhaps a picture of an optical telegraph to figure out how it works, or perhaps a chart that shows how the radio spectrum breaks down.

According to Orenstein (1995) the transmission of images over the Internet is currently somewhat problematic. Images load slowly at slow modem speeds, and they use up much more bandwidth than text. Csillaghy (1998) feels that the purpose of images in text documents is above all illustration, as buttons, anchors or decoration, and therefore does not contribute to the main purpose of fast information browsing. In the case where the main source of information is contained in images and cannot be reduced to text, an efficiency problem occurs. Naturally, image transfer is slower than text transfer, even using compressed formats. Since the number of Web users is increasing rapidly, it is likely that this situation will get worse.

Little has been done to simplify locating images on the Internet. Search engines make it possible (though sometimes difficult) to find textual information on the Internet, but finding specific images can be daunting.

All of the above lead to the conclusion that, in order to locate a specific image, it is necessary to know the best search engines where images may be searched for, as well as to know how to use these search engines effectively to find that specific image. To gain an understanding

of which search engines may be used, as well as how they may be used, some general as well as specific image search engines will be discussed. Thereafter a few tips will be given for finding that image, hopefully in the fastest and easiest way.

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## **What is an image?**

Fulton (1999) explains an image in a simple and understandable way. He uses an icon as his starting point, since it is a small and manageable image. If this icon image is blown up about a dozen times, the individual pixels of the image can be seen.

Each small square seen is an individual pixel in the original image. Pixel is a computer term for 'picture element'. Icons are just low-resolution images, usually graphic instead of photographic, and icons are normally composed of 32 rows with 32 columns of pixels. Otherwise, they are just like any other image. A few lines were added on the image to aid seeing the rows and columns of data. Each square in this grid is a pixel.

Icons are usually graphic images, built of discrete pixels, instead of being continuous tones like photographs. Some graphic artist has worked very carefully on this icon, pixel by pixel, one at a time. However, a photograph will have a more blended continuous image, because adjacent pixels will be more likely to have similar colours.

The centre of the above hot-air balloon image was enlarged 12 times to show that photographic images are also composed of pixels in the same way as an icon. If any image, regardless how sharp and clear it is, is blown up about a dozen times, only pixels will be seen. Increased enlargement beyond what makes the pixels visible cannot show additional detail, it will only make the pixels appear larger.

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## **Need for images**

The proverbial picture is worth a thousand words.

Orenstein (1995) states that images are necessary in a large percentage of Web documents: pictures can be used to illustrate a point or to tell a story; to capture and communicate scenes, events, or even ideas.

Images can also be used in marketing presentations to potential or existing clients, as to support the marketing/advertising message to the client. Images are also important in e-commerce, as Vtopia Inc. (1999) states: 'By transforming existing physical products into digital form is one way of achieving growth through Internet commerce.'

It is a well-known fact that people do not shop based on factual information alone, but respond very well to information sent visually. Thus, images are very much needed to introduce new products to the e-commerce market, as well as to advertise new and existing products. It is also only with the use of images that products for sale on the Internet can be inspected.

Another reason why images might be needed is for Internet learning. Some Internet-based courses may rely heavily on images, such as Web-based art courses. According to Rhyne (1996), art history is by far the heaviest user of images. Scholars in many disciplines increasingly recognize the need for large archives of images of works of art and for the most

complete, detailed and accurate results possible, as a necessity for their research and teaching.

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## **How general search engines find images**

Calishain (1998b) explains that by being clever in the way one searches, popular search engines can be used to find images. She looks at a few popular search engines, such as AltaVista, HotBot and Lycos.

### **1. AltaVista**

AltaVista allows one to search with a special search command, namely 'images.' For example, `image:giraffe` returns Web pages containing a graphic file containing the word 'giraffe' in the title, or with words that begin with 'giraffe,' like 'giraffe1' or 'giraffe9.'

If one uses that search query to search for giraffe pictures, about 1605 results are received. This could lead to despair (or spending too much time online previewing images). However, if additional searching commands are used, as to build a context for the giraffe image, better results are obtained. The command `title: can` be used to search for pages containing 'giraffe' in the title. The search query `image:title:giraffe` results in a more manageable number of results (about 890).

Keep in mind that even with special syntax, AltaVista can be case-sensitive; it does not treat the search queries `image:giraffe` and `image:GIRAFFE` in the same way. If only lowercase letters are used in a word, AltaVista finds all instances of the word regardless of capitalization, but if you capitalize even a single letter, AltaVista searches only for words with exactly the same capitalization.

On the other hand, giraffe images in a more scholarly context might be wanted. The search command `domain:edu` limits the search to certain domain types, so the search query `image:giraffe domain:edu` produced about 100 results of giraffe images located on computers in the educational domain.

One can also use AltaVista's inclusion and exclusion operators (+ and -) to force the system to include or omit search terms. For instance, one may want only pictures of Rothschild giraffes. Searching for `+rothschild image:giraffe` gives a picture of a Rothschild giraffe. Since these giraffes are often referred to as the 'Rothschild's giraffe', if AltaVista's wildcard character is used, the asterisk to deal with variations on the name `+rothschild* image:giraffe` provides a few more hits with giraffe pictures.

### **2. HotBot**

HotBot is a bit more complex, but it also works when searching for images. Instead of the special commands that AltaVista uses, HotBot takes advantage of checkboxes and pop-up menus.

HotBot's basic search form enables image searching. Use the 'Look For' pop-up menu to specify the basic criteria for your search (all the words, none of the words, the exact phrase) or more narrow search queries (there is an option for Boolean phrase). One can also restrict the search to page titles by selecting the page title in the Look For pop-up menu.

To continue the example from the AltaVista discussion, to search for giraffe images on

academic Web pages, the form can be filled out as follows: type giraffe in the Search field; leave all the words chosen in the Look For pop-up menu; and in the Pages Must Include section, select the image checkbox.

This resulted in a lot of pointing and clicking to suffer through, but it worked well. HotBot displays a number of results ranging from giraffes at the Washington DC zoo to a giraffe birth video. The search within this results option makes it easy to add (or exclude) additional words and phrases such as Rothschild or Kenya.

### 3. Lycos

Lycos has created a search engine just for media, called Multimedia Search. Select the Multimedia option, select the Pictures button, and click the Go Get It button.

Unfortunately, Lycos's multimedia search engine is a little more awkward to use than the HotBot engine, offering no easy way to build complex Boolean expressions, and the database appears to be far smaller.

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## Specialised Image Search Engines

According to Calishain (1998b), sites like AltaVista, HotBot, and Lycos work well for locating the occasional image. However, some people would want to explore image-specific search engines available on the Web.

### 1. Excalibur Image Surfer

One starting point is the Excalibur Image Surfer (a Yahoo! version of this service is also available), which includes a subject listing of available images and a search engine. If it is generally known what is being looked for, consider using the subject listing first. It allows one to begin with a general topic (such as Sports or Transportation) and peruse images grouped under more specific subjects, like Volleyball or Spacecraft. If the intended subject is not listed, try the search form. For example, the subject listing does not include North Carolina, but a keyword search for North Carolina brought back 59 results. Excalibur provides images in small thumbnail versions, six to a page. They load quickly, making a short task of previewing many images without surfing through several sites.

### 2. WebSEEK

Another subject-and-search image catalogue is WebSEEK, a catalogue of more than 600 000 images and videos that permits browsing by subject or performs text searches (which can be restricted to video, colour photos, grey images, or graphics). WebSEEK presents images in thumbnail format, 15 to a page. Some categories could stand to be subcategorized, for instance, the animals/zoos category lists 944 pictures - but this is still a huge number of resources available in one place. WebSEEK also features a postcard sender, which dispatches an e-mail message containing the URL of an image and a message.

### 3. The Amazing Picture Machine

To find images with more of an academic angle, Calishain (1998a) recommends trying the Amazing Picture Machine. It supports basic keyword searching using two fields, linked by a trio of operators: 'only' narrows the search to the contents of the first field; 'and' searches for both fields; and 'or' specifies a search for the contents of either field. Results appear as text-

only listings with links to actual image files. Included for each picture is its type, file size, pixel dimensions, and format, followed by a description of the subject of the picture.

#### 4. Other Collections

If the wanted images cannot be located, Calishain (1998a) recommends trying SunSite's Image Finder, which searches several different image collections, including the SunSite Image Database, the Fort Worth Star-Telegram, and the Library of Congress.

If one is interested in art in particular, the Fine Art Museums of San Francisco's ImageBase can be used. The ImageBase contains over 60 000 images of paintings, photographs, sculpture, and other artwork. One can browse particular exhibitions or search for artwork by artist's last name or keyword.

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#### Tips on Finding Images on the Internet/WWW

- Images are searchable by their assigned keywords. These words describe the images as accurately and comprehensively as possible in one of three ways: by subject matter, technically or conceptually.
- Keywords that describe the subject matter include the following:
  - Nouns that identify the main subject(s) of the image, such as 'car', 'telephone', 'sky', etc.
  - Adjectives that describe these nouns, such as 'rusty', 'antique', etc.
  - Verbs that describe the main action(s) in the image ('running', 'eating', 'swimming'). Approximate age groups of the person or people in the image: 'baby', 'toddler', 'child', 'teen', 'young adult', 'adult', 'mature' and 'elderly'. More specific breakdowns are 'young adult 20s', 'adult 30s', 'adult 40s', 'mature 50s', 'mature 60s', 'elderly 70s', 'elderly 80s' and 'elderly 90s'.
  - Nouns that indicate the number of people in an image: 'person', 'people', 'couple', 'two', 'three', 'four', 'five', 'group' and 'crowd'.
  - Ethnicity and/or nationalities of the person or people in the image: 'African American', 'Caucasian', 'European', etc. 'Multi-ethnic' can be used for groups of people of various ethnicities.
  - Locations: cities ('paris'), countries ('france') and regions ('western europe', 'europe').
  - Time periods: 'vintage', 'retro', 'sixteenth century', '1960s', etc. 'Single' is used for images of single items which are often photographed in groups. For example, 'single AND gear' will find images of only one gear.
- Technical keywords describe the attributes of the image as a graphic element and include the following:
  - Image orientation: 'horisontal', 'vertical', 'square', etc.
  - Setting: 'interior' or 'exterior'.
  - Subject orientation: 'left', 'right', 'centre'.
  - Colour: 'color', 'bw' (for black and white), 'sepia'.
  - Specific colours: 'blue', 'green', 'red', 'purple', 'multicolor', etc.
  - Object: 'object' is used for object images on white backgrounds (clipped images).
  - Background: 'background' is used for images that would be ideal for backgrounds.
  - Camera perspectives: 'close-up', 'long shot', 'detail', 'above', 'below', etc.
  - Camera perspectives of people: 'head shot', 'head and shoulder', 'waist up', 'waist down', 'three quarter length', 'full length'.

- Photographic techniques: 'blur', 'montage', 'soft focus', 'panoramic', 'superimposed', etc.
- Concepts are ideas or notions that describe the essence or underlying message of the image. Examples include 'communication', 'success', 'challenge' and 'teamwork'. Many images are assigned more than one concept.
- If searching for multiple keywords that are not a phrase, Boolean operators should be used ('and', 'or' or 'not') between the words. Boolean searching allows narrowing or widening search results. For instance, 'flower and close-up not rose' will find close-up images of flowers, but will omit close-ups of roses.
- Multiple keywords entered with a space between them will not be searched for as separate keywords, but as a phrase, e.g. asian american, road sign, christmas tree. However, if searching for a phrase that contains 'and', e.g., 'rock and roll', the phrase must be put in quotes so that the search engine does not read the 'and' as a Boolean operator.
- The wildcard character (\*) may be used to truncate a keyword and broaden the search, e.g. ski\*. The asterisk matches a string of characters and will find all images with the keywords 'ski', 'skiing', 'skier', and also 'skipper', 'skirt' and any other keywords beginning with the letters 'ski'. In the same way the query 'danc\*' returns 'dance', 'dancer', 'dancing', etc.
- End verbs with '-ing', for instance 'running', not 'run'.
- The natural language search option often works better and more easily than Boolean searching, because it allows articulation of what is being looked for in a conversational phrase, the same as in a conversation. For example, if looking for an image of a woman walking on the beach, instead of typing in 'woman AND walking AND beach', type in 'woman walking on the beach'.
- Some search engines allow 'browse by category' which makes it possible to select one or more thematic categories to browse through. The newest images from the category selected will usually be displayed first. Categories may include the following: abstract, agriculture, business & industry, education, food & beverage, lifestyle & culture, medical & healthcare, nature, religion, myth & fantasy, science & technology, social issue & government, sport & game, travel & transportation, wildlife & animal.
- It is important to note that the above tips for image searching may or may not apply to different search engines, all depending on the search engine being used.

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## Conclusion

The best way to find a certain image is through experience; gained through experimenting with different search engines, and learning which engines work best. This may not be the quickest and easiest way to find that specific image, but it may be fun and, in the process, a lot is learned.

In answer to the question, what does image searching on the Internet embrace?, it can be stated that, in order to find images on the Internet in the most effective way possible, it is necessary to be aware of the search engines available, as well as how to use them.

Calishain (1998a) admits that image searching can be a hit and miss endeavor, but the quantity and quality of image archives are growing. It is important to keep in mind, however, that just because an image is available for viewing does not mean it is also available for re-use. Before one does anything with an image besides view it, make sure it is either in the public domain, or that the rights have been secured for use (which may involve a fee).

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