New Service Promises to Improve Online Search

A new product promises to help users determine the most relevant results of their online searches.

Yolink, which TigerLogic Corp. developed and sells, accomplishes this by mining the contents of the webpages returned in response to search queries. The application examines the pages for meaning and for their relevance to the queries.

This would address what is still one of the main complaints about online searches: the need to examine and evaluate large numbers of results, many irrelevant, explained TigerLogic director of business development Brian Cheek.

Yolink helps users understand what’s behind the links provided in search results and thereby makes the process more efficient, said Greg Sterling, senior analyst with Opus Research. He is also a contributing editor for Search Engine Land, an online publication with news, research, analysis, and commentary about the search industry.

Yolink doesn’t rank the search results themselves. Instead, it uses a cloud-computing approach to process the data within each linked-to article and prioritize that information in real time.

When the results of a search query reach the Yolink server via the Internet, the system removes style notations, scripts, and everything else other than the text and the page’s hierarchical organization, said Jeff Dexter, TigerLogic’s lead architect of XML query technologies. This lets the system focus its analysis on the content.

Yolink then routes the search results to a query node. The query node establishes a separate data stream for each of the top links within a set of search results, explained Dexter.

Within the pipeline, Yolink converts a data stream into a hierarchical, tree-based model via which the system can further analyze the page by various means, including semantics. This enables the system to work with structured or unstructured data.

Yolink’s semantic and other capabilities give it a more nuanced understanding of data, data types, and data structures than other search engines, said Dexter.

Yolink ranks the results based on factors such as the extent to which they match search-query terms, and the distribution and quality of a search term on a page.

According to Dexter, the product works with multiple document types and file formats, any search engine, and any webpage with embedded links.

TigerLogic originally built Yolink as a browser plug-in, but the company now also provides a customizable API that lets users integrate the technology into their websites. This would let visitors find information on the sites more easily.

The company also sells a search widget and has a beta version of a stand-alone desktop search application. The widgets are developed using Ajax, which enables them to process large numbers of requests quickly via the Internet and makes them easy to embed in any site.

Sterling said TigerLogic’s big challenge will be convincing potential customers that Yolink will add value or better serve their users.

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Academic researchers have developed an approach that promises to make object-recognition systems efficient users of system memory and thus also of computational resources.

Postdoctoral student Long (Leo) Zhu, professor Bill Freeman, and associate professor Antonio Torralba of MIT’s Computer Science and Artificial Intelligence Laboratory worked with postdoctoral researcher Yuanhao Chen and professor Alan Yuille of UCLA to develop the recursive-compositional-models approach.

Object-recognition systems are generally used for tasks such as surveillance, to accurately identify security problems; and robotics, to enable robots to find or avoid things. They are also used in image and video search.

Like most approaches, the MIT-UCLA system learns to recognize new objects via training with digital images. It recognizes objects as a collection of parts represented as types of shapes. Rather than trying to identify, for instance, an entire car, like a traditional system would, the MIT-UCLA approach looks for components such as wheels and a car chassis to enable it to recognize the object.

The approach would recognize a vehicle’s wheel by its general shape, not because it exactly matches an image in a database, as is the case in typical systems. This means the MIT-UCLA approach needs less training to recognize objects. Also, the approach could identify component parts even if they are at an angle or partially hidden, which many object-recognition systems can’t do.

For each new item a typical system will recognize, the system must include information about all important component parts. Therefore, a system that recognizes many types of objects will have a huge database, which makes finding information more time-consuming and computationally expensive.

The MIT-UCLA system, on the other hand, doesn’t store separate sets of component parts for each object in its database. Instead it stores all similar shapes and all information about the same types of components—such as wheels—once. The same information can be used in recognizing multiple types of objects—like cars, bicycles, or wheelbarrows—that include the part. This reduces the size of the system’s database and makes the search process more efficient.

The system analyzes objects by making dictionaries that include increasingly specific descriptions of the component elements until it recognizes the item. As a simplified example, in analyzing a car, the first-level dictionary might include round shapes. The second-level dictionary might identify wheels, and a subsequent dictionary might include a car chassis. This would be enough to differentiate the automobile from other wheeled objects.

This approach enables the use of efficient inference algorithms. When finished, the system erases the dictionaries, thereby saving memory.

According to Yuille, the application will run on any platform and uses various types of algorithms, including those for image filtering and machine learning.

Object recognition is a complex research field, Yuille noted, and although the MIT-UCLA approach works as well as other systems, it isn’t ready for commercial use yet.

The researchers want to further improve their system’s accuracy by using more complex images—including those with busy backgrounds or partially hidden objects—during training.
MIRROR, MIRROR ON THE IPHONE 4

Today's smartphones do many things besides making and receiving calls. For example, they take photos, shoot video, play music, and provide drivers with directions via GPS technology.

After taking on these complicated types of tasks, smart phones can now be used for a simpler task: to function like a pocket mirror.

DLP Mobile, a mobile-application-development company that specializes in Apple iPad and iPhone, BlackBerry, and Google Android software, has released a new iPhone 4 program called the Mirror App (http://itunes.apple.com/us/app/mirror-app/id373583045?mt=8).

The application uses the new iPhone's front-facing camera to function like a high-definition vanity mirror. The Mirror App yields an exact image rather than a mirror image.

Unlike the camera itself, which requires several input functions to activate, the Mirror App works with a single click. It has four adjustable light settings—which can help in dark conditions—and three adjustable light gradients, said DLP Mobile CEO Zak Tanjeloff. The gradients simulate the light intensity in different places and under different conditions.

Users can work with a sliding scale to make color corrections as desired to account for various ambient light sources.

Some iPhone applications that claim to offer mirror functionality simply turn off the device's display to provide a reflection in the glass display surface.

DLP Mobile is currently building a Mirror App version for the new Android phones, which also have forward-facing cameras.

Apple declined to comment on why it approved the Mirror App for iPhone 4, saying that the large volume of products available in the iStore makes it impossible to discuss the merits of each.

According to analyst Will Strauss with market research firm Forward Concepts, Apple approved the Mirror App because it is harmless and might make a few customers happy.

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Two scientists have developed a system that uses ambient radio waves to generate energy, potentially eliminating the need for batteries in mobile devices.

Their research would address the limitations that many electronic devices experience because they depend on batteries that lose their power over time or in temperature extremes such as those found on job sites in very cold or hot climates, said Duke University assistant professor Matt Reynolds.

Reynolds and Georgia Institute of Technology assistant professor Jochen Teizer are working on integrating their energy-harvesting system into a prototype hard hat. The SmartHat sounds a warning when the wearer inadvertently gets too close to nearby potentially dangerous equipment—such as earth-moving vehicles or construction cranes—on a work site.

The ambient radio signals that power the SmartHat would come from transmitters mounted on the equipment. Because falls are a common problem on work sites, Reynolds noted, warning transmitters could also be mounted at the edge of areas such as pits and trenches.

SmartHat’s energy-harvesting system uses a rectifier, which transforms alternating current into direct current. The rectifier converts incoming ultrahigh-frequency radio signals, a form of AC, into the DC required to run the SmartHat circuitry.

A reservoir capacitor stores harvested energy—which lets the SmartHat continue to function even when there are no nearby radio signals—and a power management circuit sends the power to the hat’s various parts.

The energy-harvesting system powers both the microprocessor that runs the SmartHat’s software and its warning beeper. The microprocessor monitors the strength and direction of the radio signals emanating from transmitters on work-site equipment and sounds a beep when the signal exceeds a certain strength, indicating that the user is too close.

Reynolds said he designed the SmartHat’s circuitry to consume as little of the limited available power as possible.

Project Generates Energy by Harvesting Radio Waves

Two academics have developed a system that uses ambient radio waves, rather than batteries, to generate energy for mobile devices. They have built the system into a prototype hard hat that uses the energy to detect if wearers get too close to potentially dangerous equipment on a work site and to then sound a warning.

The SmartHat is tuned to the frequency of the transmitter attached to the construction equipment. Other items that use radio waves—such as Wi-Fi transmitters, cellular-phone antennas, and radio stations—transmit signals on different frequencies.

Until recently, Reynolds explained, using radio waves to power wireless electronic devices was difficult because the signals dilute quickly as they spread. However, he said, chip designers have become adept at optimizing circuits to work with small amounts of power.

Teizer said he has conducted on-site experiments at construction sites on the Georgia Institute of Technology campus and plans additional testing at a large commercial building in Atlanta.

A system limitation is that it can warn users only about machinery or hazards equipped with radio transmitters, according to Reynolds.

According to Teizer, companies will want to use the technology only if workers feel comfortable with it, it is reliable and rugged, and the cost is reasonable enough for implementation in thousands of hard hats.

The researchers are continuing to refine the technology and plan to work with commercial equipment manufacturers and construction companies to prove the SmartHat’s utility.

By harnessing ambient radio waves to power devices, innovative engineers like Reynolds and Teizer are part of an emerging cohort of researchers transforming how we address our energy needs, said Joshua Chamot, a media officer for the US National Science Foundation, which helped fund the project.

Reynolds said the system is still in the early prototype stage, so it’s premature to speculate how and when the technology could be commercialized.