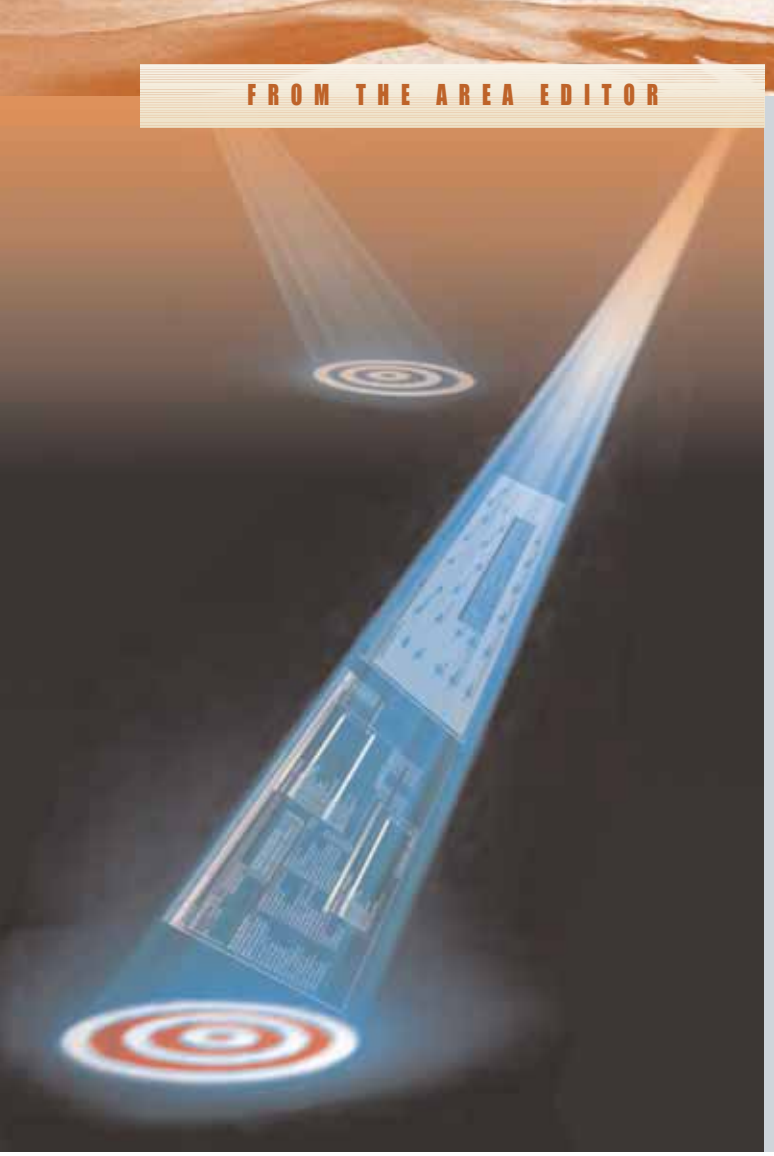

Search: The New Incarnations

Naren Ramakrishnan
Virginia Tech

Search is a thriving research topic, with novel incarnations continuing to materialize.

Search engines continue to creep into popular culture, with many books, newspaper articles, and blogs now devoted to showcasing the search business and search wars. Since our last coverage of search in *Computer*'s October 2005 issue, many more incarnations of search have materialized. This special issue includes articles covering four of these incarnations: personalized search, collaborative search, sponsored search, and mobile search.

All search engines strive to achieve relevance in search results, but relevance is quite a personal notion. Thus, an epidemiologist's search for "speaker" might possibly refer to Andrew Speaker, the lawyer who was infected with tuberculosis and recently reentered the US after taking a commercial flight, whereas an electronics buff might be seeking the latest models for sound equipment.

In "Search Engines that Learn from Implicit Feedback," Thorsten Joachims and Filip Radlinski present a system that implicitly observes which search results a user clicked on (and did not click on) and uses this information to adapt ranking functions. This article offers an example of how data mining techniques and human-computer interaction research can come together to help create a personalized search engine.

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A different way to personalize search results is collaborative search, as Barry Smyth describes in "A Community-Based Approach to Personalizing Web Search." If you are a frequent visitor to e-commerce sites such as amazon.com, you are greeted with recommendations such as "people who liked the books you like also liked this book." This is known as collaborative filtering in the recommender systems literature. Similarly, collaborative Web search harnesses a community's past search experience: "people with queries similar to yours visited these pages." Smyth surveys the ways in which a community's search knowledge can be captured and explores how communities can exchange search experiences between themselves. As he points out, there is a community behind every portal site, whose history of searches and clicks can be mined to improve search results.

It used to be the case that search engines ranked pages based purely on their secret algorithm for measuring relevance. As search engines increasingly became the gatekeepers to online information, commercial interests began to purchase placement in the search results. Type something as mundane as "paper towels" in your favorite search engine and you will notice some portion of screen space devoted to companies that sell paper towels, paper towel dispensers, and the like (to be fair, they are clearly marked as sponsored Web pages). You might instinctively shy away from such results, unless you were looking for deals on power towels. Whatever our personal opinions about sponsored search might be, there are good economic reasons why it is a thriving industry with multiple players and is here to stay.

In "Sponsored Search: Is Money a Motivator for Providing Relevant Results?," Bernard J. Jansen and Amanda Spink explore recent claims about sponsored search such as the click-through rates on sponsored links. They present a user study to ascertain whether integrating sponsored and nonsponsored results can bring in more clicks (for the sponsored results). You might find their study's outcomes surprising.

"Deciphering Trends in Mobile Search" by Maryam Kamvar and Shumeet Baluja is similarly focused on a user study, but in the context of searching from cell phones and other wireless handheld devices. If you are wondering who would want to search from a tiny, cramped keypad, you are echoing sentiments expressed by industry naysayers several years back. But mobile search is not just regular search retrofitted to small-form-factor devices. It caters to a distinctive class of users, such as those who are PDA-savvy, and a distinctive class of tasks—for example, those seeking "local" destinations. As this issue goes to press, the Apple iPhone has just been released, and all the anticipation surrounding it demonstrates the growing popularity of Internet-ready smart phones. Kamvar and Baluja compare mobile search to both wired search and mobile search of a couple of years back, revealing interesting trends about what users are searching for, query statistics, and users' proficiency with mobile search. In the future, we can expect new search interfaces that take advantage of the demographics and profiles identified here.

The articles in this issue conclude with an interesting commentary. The past year or so has been full of news stories about how search engine and portal companies have heavily courted social networking sites, leading to speculation about what types of new, integrated, services might be offered. Earlier this year, we approached Raghu Ramakrishnan, vice president of community systems and a Research Fellow at Yahoo! Research, for his perspective on the meeting point between search and online social networking. In "Toward a PeopleWeb," he and coauthor Andrew Tomkins cover this topic and present more food for thought. Their observations are set in the context of people/users expanding from being information consumers to becoming information producers. For instance, look more carefully at your typical day of online activity: Every time you visit a page, rate a movie, write an e-mail, upload photos, or blog, you are producing content.

In such a scenario, search acquires a broader connotation, and we must revisit many concepts: What types of content are we creating? How do we "chunkify" this content, reference it, and share it over the Web? How do we take away content and context created in one site to use in another? And yes, of course, how do we search for and discover content in such a setting? Ramakrishnan and Tomkins present a futuristic take on what they refer to as the PeopleWeb and identify two key computational challenges that must be met to realize it. Their article is interspersed with interesting statistics and many examples of Web sites and systems that already implement parts of their vision. They also explain why this need not just be an academic or altruistic exercise and suggest how there can be economic incentives at many levels of the pyramid.

The articles in this special issue demonstrate how search is a thriving research topic, with continued twists and novel turns.

Naren Ramakrishnan, Computer's area editor for information and data management, is an associate professor of computer science and a faculty fellow at Virginia Tech. His research interests include problem-solving environments, mining scientific data, and information personalization. Ramakrishnan received a PhD in computer sciences from Purdue University. Contact him at naren@cs.vt.edu.