

Researchers develop Internet search engine for 3-D objects

BY BRIAN BERGSTEIN
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NEW YORK — The mind-boggling speed and reach of Internet search engines mask a severe limitation: They are powered by words alone.

What a humdrum existence. The world is so much brighter and more varied, full of objects and patterns that defy searchable descriptions.

In hopes of wrapping their arms around more of that stuff, computing researchers have developed new search engines that can mine catalogs of three-dimensional objects, like airplane parts or architectural features.

All the users have to do is sketch what they're thinking of, and the search engines can produce comparable objects.

"The idea of information and knowledge, and retrieval of knowledge, has been something I've been intrigued with for a long time. This gives it a more solidified meaning," said Karthik Ramani, a Purdue University professor who created a system that can find computer-designed in-

dustrial parts.

Ramani expects his search engine will serve huge industrial companies whose engineers often waste time and energy designing a specialized part when someone else has already created, used or rejected something similar.

Rick Jeffs, senior engineering specialist at a Caterpillar Inc. engine center in Lafayette, Ind., believes Ramani's technology could help the company simplify its inventory. Jeffs' center alone has tens of thousands of different parts.

"If you've got to design a new elbow for an oil line, more often than not, we have a plethora of elbows," Jeffs said. But even though many parts are created with computer-aided design software, they are catalogued such that each has to be examined separately, a tedious task "that isn't even performed that often, because it isn't feasible or practical."

With the Purdue search engine, designers could sketch the part they need and instantly see dozens in inventory that might fit the bill.

If an item seems close, but not quite right, designers can see a "skeleton" of the part and manip-

ulate it on their computer screens — make it longer or shorter or curved, for example — and then query the database again.

"It seems like there's ever-greater demands for speed in product development, and it's those kinds of breakthroughs that are needed to keep up," Jeffs said. "This would really just add to the efficiency."

Mainstream search engines, meanwhile, are still trying to master 2-D images. For example, Google Inc.'s picture search program delivers pretty good results but can't actually examine the images it serves up. It mines the text surrounding the photos, and hopes for success.

3-D search engines have begun to emerge as improvements in computing power and interactive modeling software have deepened the pool of designs available to query.

Princeton University professor Thomas Funkhouser and colleagues have put a 3-D search engine on the Web that lets anyone sketch an object using a computer mouse, add a textual description, then search for similar mod-

els in design databases.

The results can be startling. Draw a big potato, and the system responds with a bunch of, well, potato-looking objects — and a few urns. Those seem wrong until you rotate your potato, orienting it vertically instead of horizontally, and see your sketch actually does resemble an urn, narrow on top and bottom and bulging in the middle.

Certainly this makes old-fashioned keyword searches seem a blunt instrument.

Then again, text can be far more precise than a sketch. If you're searching for information about baseball Hall of Famers, there's little chance a computer will misunderstand a query for "Willie Mays."

Professor

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teacher who "was at the top of his form."

"It's like you have this brilliant flame, and it winked out without any long prolonged decline," he said. "One feels a little sad, but I think there is a kind of celebration of his spirit."

Although Sederberg said he knew Miller "peripherally" before being made dean 10 years ago, he said he did not really get to know Miller until he worked directly with the professor's courses in the Honors College.

"We were taking it semester by semester, but he was still so on top of his game, it was hard to deny him yet another semester in the classroom," he said. "I can't help but feel a certain sense of joy of a life that was really lived doing something that he was so much in love with."

Ashley Kolaya, a second-year anthropology and psychology

student in Miller's creativity class, found out yesterday about his death.

Although she said she was skeptical at first and unsure about the course, she admitted, "it grew on me."

"He encourages people to think differently than everybody else expects you to think," she said. "His life's love was the kids that he taught, and you can't not be an amazing professor if that's really how you feel."

Kolaya said she was especially amazed at the personal relationships he fostered with his students.

"He's the kind of professor that deals with the same group of people every semester because everybody comes back to take more and more of his classes," she said. "It's seriously like he's an underground cult favorite. He has a following."

There are no plans for a funeral or memorial service.

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Bill

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a whole because of its proposed effect on increasing appropriated revenue for research and cooperation among the three major research institutions.

"That's just part of dealing with politics," he said of having the USC-Sumter provision pass with the bill.

He and MUSC President Raymond Greenberg visited legislators at the State House days after the override to thank them for their support.

"There was overwhelming support for it in the legislature, and Dr. Greenberg and I just wanted to show our gratitude for that," Sorensen said. The Senate overrode the veto 81-24.

Sanford didn't appreciate Sorensen's gesture, which was evident when Sanford thanked lawmakers who voted against him.

"It sent a very poor signal to the administration when President Sorensen came up to the State House to congratulate legislators who voted to override the veto," Sanford's spokesman Will Folks said. "It was really in-

poor taste."

Folks said the governor opposed the legislation based on its politically motivated spending, which he said was aimed at fitting irrelevant projects into an appropriations bill for research.

He said Sanford would support a possible upcoming life sciences bill with no unrelated amendments and that he supports an increased focus on appropriating research funds if they conform to a cooperative, statewide vision.

"We need to get beyond personalities here and focus on issues, which is what the governor has focused on since day one," Folks said.

Sorensen said he and Sanford have spoken several times since the override but that the conversations were at social events and the bill wasn't the topic. He said he is, however, eager to communicate with Sanford about potential future research initiatives. "I'm happy to meet with the gov-

ernor at any time and talk about whatever he wishes. He's the chairman of our board of trustees, so I'm always ready to talk with him" he said.

Folks said the governor thinks that too much communication between him and USC is done through newspapers and that issues should be openly discussed more often.

Sorensen and Sanford have fervent support from top faculty members when it comes to expanding research at the three research universities.

"Politically it's a good move because it gets all the universities on the same team," chemistry professor John Dawson said. "But it's also a sensible thing to do to combine our talents."

Sorensen said he isn't worried about a lawsuit because it's not something the university can control.

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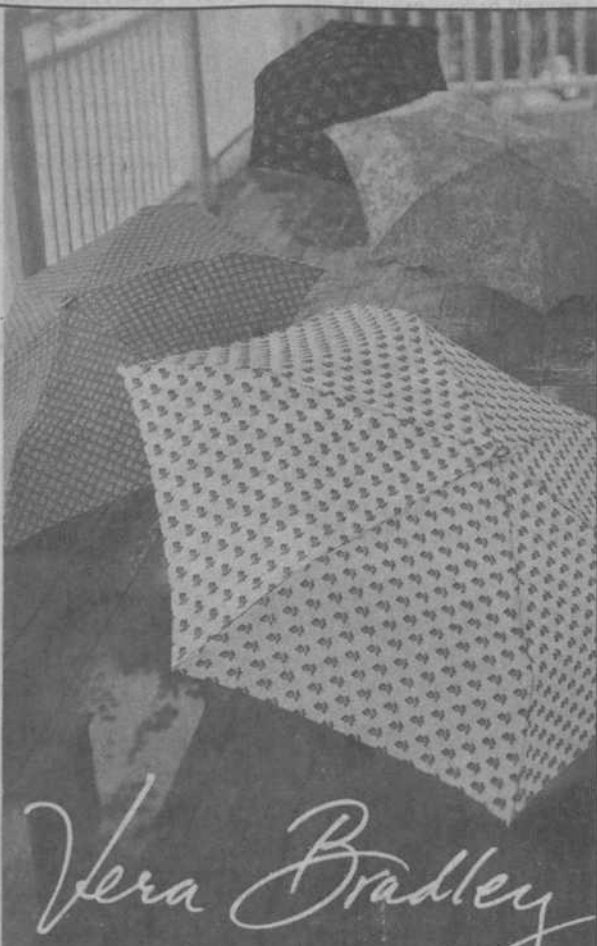
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