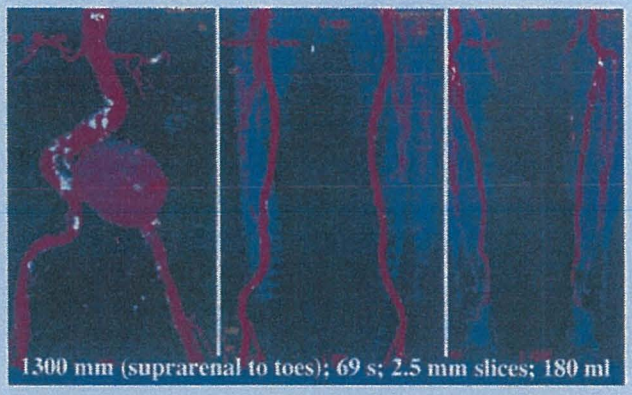
Developments to Watch

EDITED BY NEIL GROSS

FORD SLIPS A NEURAL NET UNDER THE HOOD

FORD MOTOR CO. HAS A BETTER idea for diagnosing engine trouble: an advanced neural network program running on chips designed by NASA's Jet Propulsion Laboratory. Starting in 2001, the chips will continuously monitor Ford car engines for misfires caused by such problems as damaged piston rings.

Today, onboard computers can't detect misfires under all operating conditions. So they are built to be hypersensitive: They catch misfires, but with an unacceptable level of false alarms. Ford's neural net program does a better job because, like the human mind, it learns by doing. When fed data on deliberately induced engine misfires simulating all operating conditions, the program learns to spot problems with precision. JPL designed the hardware, compressing the electronic elements onto a chip. Ford has the right to license the chip to other carmakers, and JPL holds the rights for nonauto uses. *Larry Armstrong*



1300 mm (suprarenal to toes); 69 s; 2.5 mm slices; 180 ml

QUICK WORK FROM A NEW CT SCANNER

GENERAL ELECTRIC CO.'S NEW COMPUTED TOMOGRAPHY (CT) scanner is a speed demon. Like earlier systems, it uses detectors to collect data from an X-ray source that circles a patient lying in the doughnut-shaped device. A computer translates the data into 3-D images, or slices of the patient's body. But instead of one row of detectors, GE's LightSpeed system uses 16. Doctors can see multiple slices simultaneously and scan the body six times faster than with existing systems.

That means doctors can begin to replace uncomfortable, invasive diagnostic procedures. At Stanford University, radiology department chairman Gary M. Glazer and his colleagues recently used the LightSpeed to examine a dilation, or aneurism, in a patient's pelvic artery (picture, left). Ordinarily, the exam would require threading a catheter through the groin to inject special dyes. LightSpeed let the Stanford team skip the catheter. And they could simultaneously view the arteries of the patient's thigh and lower leg (pictures, right) to make sure that the vascular disease was localized. "We could study the leg vessels down to the toes," Glazer says, "and diagnose the patient in about a minute." □

A SEARCH ENGINE GETS A SEARCH ENGINE

WITH MOST INTERNET search engines, winnowing out the chaff can be tedious. For a broad search term such as "trek," the HotBot program (www.hotbot.com) from Wired Digital Inc. turns up some 169,000 matches—everything from Star Trek to mountain bikes. Only the most persevering surfers ever reach the treasures buried beyond the first few screens of links. But you can now piggyback on their diligence.

Direct Hit is a HotBot aid that prunes the number of links to just the 10 top sites, including many far down the list. Direct Hit keeps tabs on which links are followed—but with a clever twist. Clicked-on links further down the list get progressively higher scores. So even if only a tiny percentage of people follows link No. 174, say, it could move into the Top 10, says Gary Culliss, chairman and co-founder of Direct Hit Technologies Inc. in Wellesley Hills, Mass. If Direct Hit has compiled the data for a ranking, then HotBot will notify you at the top of its results page.

There's another ranking system that may be even better for managers. Google (http://google.stanford.edu/) rates Web sites by the number of other sites linked to them. The rankings, in other words, are determined not by surfers, but by Webmasters who presumably took time to evaluate a site before setting up a link to it. It's an adaptation of the time-honored practice of assessing scientific papers by the number of citations they've gotten in other papers. *Otis Port*

INNOVATIONS

■ Vegetables you might never find together in a salad are swapping genes to create useful new food products. Researchers at the Center for Plant Breeding and Reproductive Research in Wageningen, the Netherlands, last week reported that they had created a low-calorie, natural sweetener by adding a gene from a Jerusalem artichoke to sugar beets. The gene enables the beets to manufacture the sugar fructan—instead of sucrose, which is refined into table sugar. Fructan tastes plenty sweet, but it's much harder for the body to break down, so it doesn't add to the calorie count.

■ Unlike marching ants, they don't devour hapless creatures in their path. But army worms are on the march in Florida, Georgia, and other Southeastern states, where they are decimating thousands of acres of farmland. Up to 1.5 inches in length, the worms lay as many as 800 eggs at a time and can chew through a cotton field in 48 hours. Pest experts at the University of Florida say the most effective weapon is a new pesticide called spinosad, which kills the worms but leaves most beneficial insects unharmed. So far, spinosad has been approved for use on cotton fields.

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