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ROBO SPACE

Robo Doc Gets An Eyefull

Pasadena - Nov 5, 2001

A five-minute vision test using a laptop computer with a touch-sensitive screen can be used on Earth and in space to help diagnose the onset of eye diseases and even certain types of brain tumors.

With one eye covered, a person sits in front of a computer screen divided into a grid. The subject stares at a central spot on the touch-sensitive screen and, using a finger, outlines missing areas of the grid. The computer records, processes and displays a 3-D image of the subject's visual field. The test for each eye takes about 4 to 5 minutes.

"As NASA moves forward to establish a permanent presence in space, this may be considered a breakthrough step for the creation of an autonomous onboard physician," said Dr. Wolfgang Fink, physicist and senior member of the technical staff at NASA's [Jet Propulsion Laboratory](#), Pasadena, Calif.

"It is a non-invasive, quick and easy process that gives [astronauts](#) and physicians on the ground an almost instant auto diagnosis. This type of technology will be useful for long-term space missions where early detection and advance monitoring will be key to the health of the astronauts."

Fink, a visiting research assistant professor of ophthalmology at the University of Southern California, Los Angeles, developed the 3-D Computer-Based Threshold Amsler Grid Test as part of his post-doctoral research while at the California Institute of Technology in Pasadena, with his colleague Dr. Alfredo Sadun, Thornton professor of ophthalmology at USC. Caltech manages JPL for



File Photo: Mika Kawasaki, Japan's Mitsuwa Electric employee chats with a prototype nursing robot Tamapy, developed by Japan's Matsushita Communication Industrial to support at-home day-care for elderly people at the Mitsuwa Electric's exhibition in Tokyo 23 June 2000. The robot enables to chat by himself and also features sensors for health-care such as thermometer, tonometer, pulse measurement to provide real time data communication with a medical care center or a family doctor through the mobile phone network. AFP Photo by Yoshikazu Tsumo - Copyright AFP 2000

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NASA.

"This new test is not only more revealing than standard visual field tests, but it is also much quicker and simpler than existing methods. This test may make visiting an ophthalmologist cost-effective, convenient and fast, giving the doctor a tool to do a better job," said Sadun.

This tool has been undergoing testing in clinical trials that began last year at the Doheny Eye Institute, Keck School of Medicine at USC. Trial results show that the screening test helps detect a variety of eye conditions, such as glaucoma and macular degeneration-- the two leading causes of blindness. Early detection of these conditions and appropriate treatment are crucial in preventing further loss of sight.

Caltech has filed a full patent on the screening test, and several companies have expressed interest in licensing the technology that may become commercially available as early as next year.

Future uses envisioned are: monitoring the effects of intracranial pressure elevation in low-gravity environments and evaluation of possible stroke onset and of acute and chronic stroke conditions.

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ROBO SPACE

Robots Puts Students First

Pasadena - Nov 5, 2001

As the buzzer sounds, the robots sprint toward the center of the arena. Using metallic "arms" and other clever gadgets not seen on humans, the remotely controlled machines manage to grab a giant beach ball and attempt to dunk it into an oversized basket.



Drilling Into The Future

Pasadena - Sept. 6, 2001

Imagine a drill that penetrates granite using only the power of a flashlight battery. Then imagine sending that energy-efficient drill to another planet to explore beneath the surface. Or, perhaps, visualize putting the lightweight, sensitive instrument to work on Earth to improve medical care. Such a drill, recently developed at JPL and Cybersonics, Inc., has that power and potential.



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