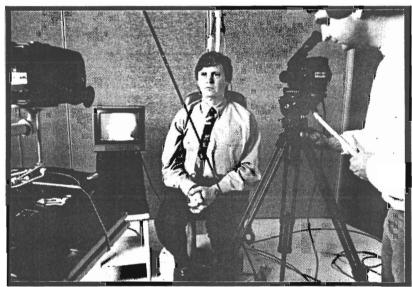*For Immediate Release*
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REDUCING THE COST OF COMPUTER GRAPHICS: 3-D OPTICAL DIGITIZER EXPANDS APPLICATIONS FOR ANIMATION, MODELING & VISUALIZATION

A new device for automatically generating detailed computer descriptions of complex three-dimensional objects may help expand the use of computer animation, computer-aided design and engineering, scientific visualization, medical simulation and special effects.

Called a "3-D Optical Digitizer," the device would provide film and television producers, reconstructive surgeons, industrial designers, scientists and others with a low-cost means for creating the basic computer descriptions needed for animation, modeling and visualization. The basic descriptions serve as a foundation for computer correction and manipulation work needed to produce

Optical digitizer developed at Georgia Tech is used to generate a computer model of Lab Co-Director Michael J. Sinclair. The devices promises lower costs for scanning objects. (Color/B&W Avail.)

dramatic images.

Developed in the Multimedia Technology Laboratory at the Georgia Institute of Technology, the scanner would eliminate tedious and time-consuming work now often done manually with pen digitizers and other basic tools.

"There are some pretty sophisticated graphic-based commercials on television that cost marketers a lot of money

because they are hand-designed from the ground up," explained Michael J. Sinclair, co-director of the Multimedia Laboratory. "This device would enable a graphic designer or artist to import a very complex shape into a computer graphic program in a few minutes."

Optical scanners capable of generating computer models already exist, but their

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cost is beyond the means of many potential users -- and most of the scanners can accommodate only relatively small objects. The Georgia Tech device can handle large objects, including the full human figure, Sinclair said.

The scanner uses three video cameras to obtain information about the contour of an object as it is lighted and slowly rotated on a turntable. Proprietary electronic equipment converts the video input to the basic mathematical description computers need to model complex objects. The data is made available in standard (.DXF) format files compatible with computer systems.

"Once you get the basic description of the object, both its color and its form, the artist can do the electronic alterations to change the color and texture, make distortions or other changes," Sinclair explained. "Designers can then augment the system using readily-available electronic sculpting tools -- such as computer-based modelers available from AutoDesk's 3-D Studio, Wavefront and Thompson Digital Imaging -- to manipulate the object."

Because they readily absorb light, the hair and eyes of the human figure are difficult to scan. The new Georgia Tech scanner overcomes many of those problems, Sinclair said.

The "Golden Athlete" featured in Atlanta's multimedia bid for the 1996 Summer Olympics was hand-digitized from a plaster sculpture. The time and difficulty involved in creating that model led to development of the scanner, which was later used to build a computerized bust of Georgia Tech President John Patrick Crecine. In a promotional video for a new student service facility, the bust -- part of furnishings in the planned "Success Center" building -- invites students to attend Georgia Tech.

Sinclair believes the new scanning device is part of the trend toward lower cost and more widespread availability of multimedia computing.

"Three-dimensional modeling, animation and rendering are becoming much more accepted -- and expected -- by the public, and there are more and more graphic animators," he said. "The technology is migrating to desktop computing equipment and low-cost workstations, allowing more people to get involved with this work."

Sinclair believes his optical digitizer would allow users to purchase a complete scanning/animation system running on a high-end personal computer for approximately $15,000. Currently-available systems designed to do equivalent work can cost more than $100,000, he noted.

One area of expanding interest has been the use of computer graphics to simulate the effects of reconstructive surgery. After scanning a patient's head into the computer, the surgeon can study how bone alterations and other changes might affect the patient's facial features.

Another application would be for industrial designers who want to make computer-aided design (CAD) models of existing products. By quickly and automatically generating a basic computer description of such objects, the scanner would save the time required for creating models by traditional computer graphic modeling methods.

The scanner has been successfully demonstrated in a proof-of-concept prototype, but additional development is needed to produce a commercial prototype. That work is being supported by a grant from Georgia Tech's Faculty Research Commercialization Grant Program, designed to help faculty members develop commercial products from their research. The grant was among the first provided by the program, which is administered by the institute's technology business incubator, the Advanced Technology Development Center (ATDC).

Sinclair hopes to license the technology to a company that would be interested in producing the scanner as a commercial product. As the development proceeds, he has been testing the scanner on a variety of commercial projects that will help demonstrate the capabilities of the system.

The Multimedia Laboratory is offering scanning services to clients in order to facilitate further development of additional features -- and to satisfy demand for this advanced service.

For additional information about the 3-D Optical Digitizer, please contact Robert Gemmell at (404) 853-0471.