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hand gear to projection. "There are gradations from full immersion to projection systems."

Steven Aukstakalnis, author of "Silicon Mirage: The Art and Science of Virtual Reality," and president of Matrix Technical Services and Matrix Information Services in Lathrup Village said virtual reality will help make all the predictions about how computers will improve people's lives come true. Aukstakalnis said the fundamental principle behind virtual reality is this: "Instead of making people more computer like, lets make computers more human like."

"Let's say you have a computer generated cup on a computer screen and you want to look at the other side," he said. "On a computer, you have to turn a dial, move a mouse or type a series of commands into a keyboard."

Despite all of the advances that have made in computers, it is still very unnatural process, he said.

"With virtual reality, you just reach out and turn the cup," Aukstakalnis said.

Even at its current stage of development, virtual reality has already proven to be a tremendous tool to manufacturers, he said.

From the mundane to the spectacular, virtual reality is eliminating time and increasing efficiency to enable companies to develop new techniques and bring products to the market much more quickly than previously possible.

Virtual reality is more than just a simulation, Aukstakalnis said. "It's an interactive simulation."

For example, Caterpillar Inc., the manufacturer of heavy construction and farm equipment, has used virtual reality to design a combine, a vehicle used to harvest crops.

Through the use of virtual reality, Caterpillar was able to confirm or reject questions regarding visibility from the combine's cab

so operators can see better.

"That means tremendous cuts in engineering time," Aukstakalnis said. Virtual reality can be used in a variety of similar applications. A car design that currently takes three years to bring from concept to manufacturing could be brought about within six months.

"This is only the beginning. Within the next two years, we'll be seeing a lot of new software that will greatly accelerate the use of virtual reality."

Let's say an architect wants to show a home buyer a new house design. Currently, he rolls out a blueprint and tries to convey what the home will look like in three-dimensions.

"Most people can envision three-dimensions from a drawing, though," Aukstakalnis said. Virtual reality would allow an architect to take a client on a guided tour of a house yet to be built.

"We have new software that will allow the user to make changes inside the virtual reality environment," he said. If a client were to express dissatisfaction with the placement of a window, for example, the architect could reach out, grab the window frame and pull it across the wall."

"And that change will be reflected in the computer assisted design drawings," Aukstakalnis said.

Researchers are also developing ways to place buildings within real-world simulations. Using the example of the house, an architect could have a series of photographs or a video tape taken of the proposed site for the house and then have the site superimposed around the virtual reality generated house.

"When the architect moves the window, you can tell which way would give the better view of a lake or surrounding property," Aukstakalnis said. The architect

could even move the house on the site until the client is completely satisfied.

Brian Lareau, executive editor of Virtual Reality News, a general interest magazine about virtual reality published by Magellan Marketing Inc. in Farmington Hills, said virtual reality has unfortunately gotten a bad rap in the media and in Hollywood.

People would be surprised at the uses virtual reality has even at this early stage of development. "Anything you can do in the real world, you can do in a virtual world."

One of the most important industries served by the developing technology is engineering and one of the more helpful ways virtual reality is used by engineers is through "virtual prototyping, Lareau said.

"Manufacturers spend hundreds of thousands of dollars on prototyping," he said. "Virtual reality is more cost effective."

Presently, an automobile manufacturer designs a car (typically on computers), builds small scale models, looks for mistakes and makes corrections, takes those models and develops full scale models, looks for mistakes and makes corrections, and then designs a working prototype, and looks for mistakes and makes corrections, Lareau said. If a car passes each step without engineers discerning any uncorrectable flaws, it is then that the car is actually built.

Despite how accurate and intuitive engineers have become with this system, errors are often not discovered until late in the design process, sometimes resulting in major engineering changes or even the scrapping of a project.

With virtual reality, the time and costs of the process is dramatically reduced.

Virtual reality is also being used as a teaching tool, he said.

Surgeons-in-training currently rely on the availability of cadavers to gain the hands on experience they need in order to prepare themselves for the real thing, Lareau said.

Difficult or untried surgical techniques are often tested on real patients.

Now imagine that a doctor could attempt a radical new surgical technique on a patient early in the development stages without risk to an actual patient. Problems with that technique could be discerned early in the process.

Virtual reality allows this. Doctors strap on specially designed head gear and body apparatus that allows them to immerse themselves into a computer-simulated operating room with a computer-simulated patient.

This gear is so advanced that special gloves provide actual tactile feedback and actually simulate the slight back pressure felt when a surgeon makes an incision with a scalpel, Lareau said.

These are just a few of the uses of virtual reality that are only limited by the ability of computer programmers to develop a program sophisticated enough to imitate reality.

"Virtual reality is developing at breakneck speeds," he said. "Things are moving a lot faster than people think."

Nintendo, the home video game manufacturer is planning to bring out head gear that will allow players to immerse themselves into a video game for between \$200 and \$300 in time for Christmas.

"Three years ago, you couldn't touch something like this for less than a quarter of a million dollars."

"Forty years ago, not everyone had a television because some people didn't think it was necessary," Lareau said. "Now everyone has one."

## DATEBOOK

- **VIRTUAL REALITY**  
Oakland University is sponsoring a Virtual Reality seminar with demos on Friday, June 11 at the Rochester Hills campus. Call 370-2200.
- **PROFESSIONAL WOMEN**  
The Professional Women's Network will host its Monthly breakfast club on Friday, June 11 at the Botsford Inn in Farmington Hills beginning at 7:30 a.m. Call 478-8122 or 647-0747 for more information.
- **OCBC**  
Larry Williams, store manager, Hudson's Northland, and Dennis Toffolo, president, Hudson's will address the Oakland County Business Consortium at its general membership meeting Saturday, June 12, from 10 a.m. to noon.
- **WORKERS' COMP**  
"Workers' Compensation: Mediations, Redemptions and Trials", a seminar sponsored by the American Society of Employers is scheduled for Monday, June 14 from 9 a.m. to 4:30 p.m. Speaker Ervin Vahratian, former director and deputy director Michigan Bureau of Workers' disability compensation. Call 353-4500 for information.
- **MACPA**  
The Michigan Association of Certified Public Accountants is presenting its annual Administrative Staff Development Conference on Tuesday, June 15, at the Embassy Suites Hotel in Southfield beginning at 8 a.m. Speaker Marilyn J. Semonick, president of Spectrum Communications, will discuss "Obtaining the Leading Edge." Call 855-2288.
- **PERFORMANCE APPRAISALS**  
"Conducting Effective Performance Appraisals", a seminar sponsored by the American Society of Employers is scheduled for Tuesday, June 16 from 9 a.m. to 4:30 p.m. Speaker Joyce Kelly, Marshall Group. Call 353-4500 for information.
- **NAFTA**  
The North American Free Trade Agreement will be discussed by Wilhelm Kast, chairman of the Michigan Export Authority and DPCS International Inc., and Leslie Touma, executive director of the Michigan International Trade Coalition, at the Wednesday, June 16 Oakland County Chamber of Commerce economic forum. Call 466-8600.
- **DATA PROCESSING**  
The Detroit Chapter of the Data Processing Management Association will hold its June Meeting on Wednesday, June 16, at the Skyline Club in Southfield. 696-2707.
- **SUPERVISOR'S SAFETY ROLE**  
"Supervisor's Role in Safety", a seminar sponsored by the American Society of Employers is scheduled for Wednesday, June 16 from 9 a.m. to 1 p.m. Speaker Richard Zdeb, safety consultant, Michigan Department of Labor. Call 353-4500 for information.
- **MARKETING PROFESSIONALS**  
The Society of marketing professionals will be the focus of the June 17, 1993 meeting of the Society of Marketing Professional Services to be held at the Troy Marriott in Troy. Call 351-4619.
- **WRITE US**  
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