

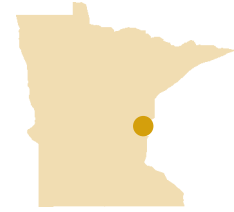


Minnesota
STATE COLLEGES
& UNIVERSITIES

INSTITUTION	PROJECT/REQUEST	LOCATION
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Pine Technical College
Johnson Center for Virtual Reality

Virtual Reality Simulator System and Training
\$1,500,000



Pine City

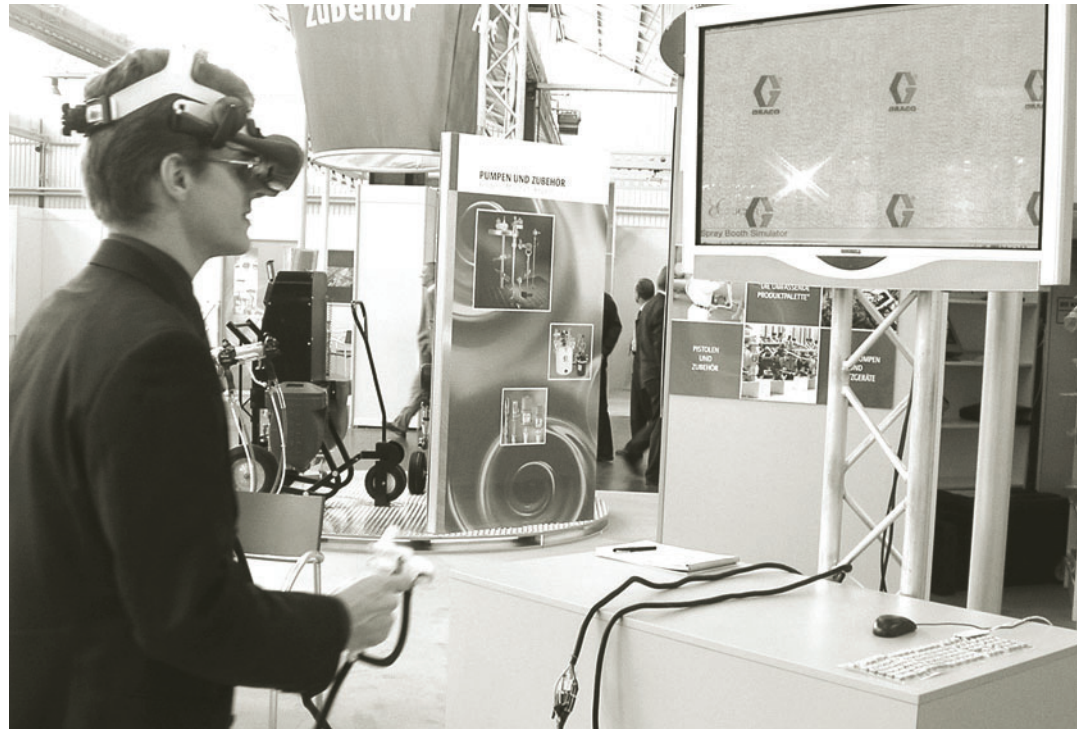
Project at a Glance

- Establish a virtual reality simulation system and training program for military, industrial and maintenance training
- Work with military personnel to establish training standards, customize the system and establish a training plan
- Continue to work collaboratively with all service branches' project managers to complete project (started FY2005)

Project Description

Military branches have bases and depots responsible for maintaining equipment including aircraft, vehicles, watercraft and weapons systems. Almost all equipment is painted with high-performance coatings that must withstand extreme environmental conditions. For example, aircraft coatings must perform flawlessly both while the aircraft is parked on a 120-degree Fahrenheit flight line and at high-altitude temperatures of -55 degrees Fahrenheit.

Army weapons systems coatings must be resistant to chemical warfare agents and solvents while also providing camouflage protection under visible and infrared illumination. Too-thick coatings



A personal computer-based virtual reality system is tested at an international exhibit.

may delaminate or reduce aircraft payloads. Too-thin or uneven coatings may allow corrosion or wear quickly. Failure of these coatings may put personnel and equipment at risk and necessitate premature repainting and maintenance.

Training painters is difficult, slow and costly. Current training consumes protective gear, expensive materials, pollutants, paint booth time and one-to-one attention from an expert instructor. Only a few painters can be trained at any one time.

Pine Technical College offers a personal computer-based system and training solution. When training with the Virtual Reality Spray Paint Simulator, painters learn correct painting techniques while using a mock spray gun to apply virtual paint to a computerized image projected onto a screen.

The expert system provides immediate visual feedback to the trainee while scoring and recording performance. The system works with no respirators, no expensive materials, no emissions or

hazardous waste, minimal incremental costs and maximum use of instructor time. The system engages the users, is transferable to the actual paint booth and, most important, results in correct coating application by the trained painters.

The Johnson Center for Virtual Reality

The Johnson Center for Virtual Reality provides consulting services that include analysis of development platforms, evaluation of computer

systems and peripherals, trouble-shooting of virtual reality hardware and software, design assistance and specification of systems. Customized training is provided for design and production staff, acquisition and setup for complete or partial systems, and other services as needed.

The center designs, produces and maintains virtual reality systems to meet the needs of education, industry, government and individual clients seeking simulations for training, planning, visualization, prototyping, demonstration and sales. These systems and simulations are purchased by the client or leased for short-term use. Levels of simulation range from simple screen-based environments to fully immersive systems with head-mounted displays, motion tracking, stereo sound and multiple users.

The center assists prototype designers who wish to use virtual prototyping to check the operation and viability of new objects or assemblies by “building” them as a computer model before going to the expense and trouble of making physical models.

This computer prototype can be used to identify potential problems in a faster, less expensive and safer way than with traditional physical prototypes, thus shortening design cycle times and reducing overall costs.

The Johnson Center for Virtual Reality uses easily available commodity computers with a variety of virtual reality-related peripheral devices that include 3-D graphics adaptors, head-mounted displays, motion trackers, various custom-made mock-ups and other interface devices. Development continues in both Windows and Lynx operating systems.

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Industry Collaborators:

- Atscott Manufacturing Company, Inc.
Pine City, Minn.
- Heat-N-Glo Fireplace Products, Inc.
Lake City, Minn.
- Chart Industries, Inc.
New Prague, Minn.
- Progress Casting
Minneapolis, Minn.
- Digital Technology Center
University of Minnesota
- Lehman's Garage
Six locations in
Twin Cities



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