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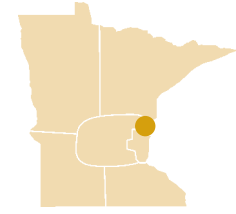
PROJECT/REQUEST

LOCATION

**Pine Technical
College**
**Johnson Center for
Virtual Reality**

Virtual Reality
Simulator System and
Training Program

\$1,500,000



Pine City

Project at a Glance

- Establish a virtual reality simulation system and training program for on-base military training
- Work with military personnel to establish training standards, customize the system and establish a training plan
- Continue to work collaboratively with Army project managers to complete project (startup 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



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

coatings 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 display, 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 high-end personal computers with a variety of virtual reality-related peripheral devices that include 3D graphics adaptors, head-mounted displays, Polhemus motion trackers, 3D mouse and Fakespace touch-gloves. Platforms evaluations include Multigen-Paradigm's Vega and Lynx, Realimation's VSG, EAI's Sense8 WorldUp and World Tool Kit, and EON Reality's EON and SDK.

Participating Institution:

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Industry Collaborators:

- Atscott Manufacturing Company, Inc.
Pine City, Minn.
- Glenn Metalcraft, Inc.
Princeton, Minn.
- Ingenuity Industrial Machining
Mora, Minn.
- Team Engineering
(formerly Motek)
Cambridge, Minn.
- Schlagel, Inc.
Cambridge, Minn.
- Heat-N-Glo Fireplace Products, Inc.
Lake City, Minn.



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