

Training, Simulation and Performance Improvement

Our line of heavy equipment simulators for excavation (shown), loading and grading is now commercially available from a large heavy equipment manufacturer. Using the simulators, new operators can safely and cost-effectively learn about job site hazards, safety violations, machine controls and more.



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As a leader in meeting clients' workplace challenges, Southwest Research Institute offers one of the widest selections of training and simulation techniques and delivery modes available.

We are embracing blended learning, which combines virtual and physical learning approaches, using multiple delivery methods such as smart phones and social networking tools. Our automated, web-based Assisted Blended Learning Environment decision support tool allows training personnel to determine the best blend of instruction for maximum retention. The tool considers classroom, web-based, simulation, on-the-job, mobile, social and other learning methods.

SwRI continued development of our line of commercially available heavy equipment simulators. The first system, available in 2008, cost-effectively trains operators on excavators. In 2009, we completed four-wheel drive loader and motor grader simulators. Each system includes desktop software and controls that replicate equipment in the vehicle cab. The simulators teach operator techniques, safety procedures and machine controls in a virtual, risk-free environment.

The Generalized Operations Simulation Environment tool allows SwRI analysts to cost-effectively build and deliver immersive learning products and serves as the backbone of several simulation programs (simulation.swri.org). Using this software, we have built virtual F-15 and A-10C aircraft simulators and several web-based telecommunications courses. This year, we expanded GOSE™ to include a tool that enables clients to build courses. Non-programmers can use an interactive interface to rapidly develop immersive, simulation-based training.

We also have developed a tool suite to help instructional developers reduce course creation time while conforming to shareable content object reference model standards and specifications. The suite includes a content development and delivery engine, a library of more than 40 dynamic content templates, tools to auto-generate pre- and post-tests, and a course generator tool that creates a SCORM-conformant course package.

As clients increasingly require unique delivery methods for information and training, we developed a prototype "wearable workspace" to give technicians hands-free access to electronic reference manuals in industrial settings. The system uses a lightweight, head-mounted display, a wearable computer and components to capture head gestures, enabling the technician to efficiently interact with data.

Voice recognition, or a combination of both methods, also can be used to control the system.

Our team continues to support the Air Mobility Command at Scott Air Force Base, Ill., developing new features and enhancements for the Aircraft Maintenance Training Enterprise System (instructional.swri.org). Recent changes to the e-testing capability allow Air Force Reserve and Air National Guard units to access the system from non-military networks via the Air Force Portal.

Since 2003, SwRI has helped organizations capture expert knowledge at risk of being lost through staff retirements and attrition. Our five-step expert knowledge transformation model helps organizations identify and prioritize the knowledge at risk, capture knowledge using a range of extraction techniques and code it for reuse throughout the organization. SwRI's Expert Knowledge Manager tool suite supports the EKT process. The EKM includes a capture prioritization tool, knowledge extraction and question guides, and a digital player that allows the expert knowledge to be viewed on a variety of devices to include mobile delivery options.

The staff developed a process to validate course compliance with Section 508 of the Rehabilitation Act, which requires that people with disabilities can access and use government information and data. With this process, courses can be re-engineered at significantly lower costs to meet government standards for the disabled. ❖

Visit tssystemswri.org for more information or contact Vice President Dr. Katharine Golas at (210) 522-2094 or katharine.golas@swri.org.

1. SwRI engineers developed a "wearable workspace" that allows technicians to reference technical manuals using voice recognition or a head-mounted tracker, which is useful in noisy industrial settings.
2. One of our web-based and immersive simulation training systems trained more than 70,000 telecommunications students this year, resulting in a 2009 Supplier Award from a major client.
3. Our web-based Assisted Blended Learning Environment decision support tool helps training personnel make a comprehensive assessment of instructional methods available and "blends" the best methods for maximum learning and retention.