As the government centralizes its training and simulation programs, Southwest Research Institute has stepped up its service to industry, which has a renewed interest in web-based and immersive simulation for training.

The latest in SwRI’s line of heavy equipment simulators trains operators on the proper use of dozers, offering an inexpensive, safe environment for training in real-world construction scenarios (simulation.swri.org). Excavator, loader and motor grader simulators also are available. More than 150 simulators, including desktop software and controls that replicate vehicle systems, have been sold by a large heavy-equipment manufacturer.

Staff members improved the VirtualPaint® system developed for the Iowa Waste Reduction Center to include more accurate modeling, simulation of an airless spray gun and techniques for displaying paint runs. The system trains users on proper setup and technique using an actual spray gun to improve finish quality and reduce waste.

Our MAICE Station™ crowd modeling software, which allows users to predict and manage crowd behavior, is now available for licensing (maice.swri.org). Other tools model crowds as single entities. MAICE Station software models the conduct of individuals and their roles in a crowd, including such behaviors as independent thinking, following and leading, showing aggression and resistance, and interacting with the environment and other individuals.

Studies of game-based learning have shown it is an excellent tool when teaching problem-solving, decision-making and critical-thinking skills. This year, trainees can safely and inexpensively learn about job site hazards, safety violations, machine controls and more using our line of heavy equipment simulators for dozers (shown), excavators, loaders and graders. The systems are commercially available from a large heavy equipment manufacturer.

Staff members capture the tacit knowledge of a leading expert in impact physics to retain valuable knowledge that could be lost through attrition or retirement. Information gathered from interviews and other less-intrusive methods is then coded for reuse throughout the organization.
we developed a game that tasks jet engine test cell operators to respond to emergency conditions to avoid personal injury and damage to engine and test equipment.

Building on the success of game-based learning and the growing acceptance of games by learning organizations and corporations, staff members are evaluating the use of micro-games and win-lose strategies used to support a learning objective. Micro-games apply the key component in recreational games and simulators — the need to think through actions and consequences — to teach objective-level tasks and techniques (training.tspl.swri.org).

As the economy recovers, workers previously considering retirement may soon feel comfortable leaving the workforce. Our expert knowledge transformation model helps organizations identify and prioritize knowledge at risk of being lost through retirement or attrition, capture that knowledge and code it for reuse. One-on-one interviews effectively capture knowledge in danger of being lost, but are time-consuming. We began laying the groundwork for less intrusive methods of capturing tacit knowledge. This diffused approach will employ e-mail or mobile device applications, pose a question of the day or use our knowledge domain banks to elicit the next-best question for efficient knowledge capture.

The convergence of concepts popularized through Web 2.0 technologies, such as blogs, wikis, social networks and other informal learning tools has changed the framework for how learning is supported within organizations. We are incorporating these tools within our expert knowledge transformation model to build a community of informal learning around key topics.

Mobile technologies are playing a larger role in numerous areas of the simulation and training market. Wireless computers, smart phones, tablets, networks, tracking, and miniature position and orientation sensors are just a few of the technologies we are applying to produce human-portable, network-centric systems and tools.

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