

VIRTUAL REALITY TRAINING OF SKILLED TRADESWhat is the innovation?

VRSim, Inc., has built a suite of products which utilize virtual reality to train members of the skilled trades in a way that is cost effective, efficacious and environmentally friendly. The innovative thread that weaves through each of the products in the family is the use of sophisticated gaming and simulation technologies to create a training experience that provides rapid learning, with an engaging educational framework. It provides faster deeper training to the student in a technological mode that she understands. This core of learning technology is more than game mechanics applied in a different domain, it is creating a training experience that teaches core concepts more effectively. From the educator's viewpoint, VRSim products help speed the development of skill sets that lead to certification in critical construction skill sets (e.g., welding and coatings applications). Academic research has demonstrated the process works – trainees are better welders as a result of their virtual welding experience. *See Virtual Reality Integrated Weld Training*, Richard T. Stone. In short, the innovation is taking the hard won blue collar skills and translating that experience into a form that is an effective teaching tool for the iPad generation.

Where and when it originated, has been used, and is expected to be used in the future?

In 2001, VRSim began providing virtual reality engineering solutions for large industrial concerns, primarily defense manufacturing companies. Following some Office of Naval Research sponsored work, VRSim self funded the creation of SimWelder™, a standalone welding training device. Within three years, SimWelder had spread to six continents. The product's novel, but effective, approach garnered the attention of Lincoln Electric who, in partnership with VRSim, created the VRTEX 360. Building on the success in welding, VRSim released SimSpray and SimSpray Industrial in 2010 and 2011.

Current Use – Virtual welding trainers (both SimWelder and VRTEX 360) are currently in use on six continents. In addition to larger equipment manufacturers (e.g., Caterpillar), the virtual welding enjoys wide support with the American Welding Society, the International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers, the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada, as well as a host of nationally recognized construction companies (e.g., Vermeer, 4Front Engineered Solutions). SimSpray has also enjoyed a diverse client base from technical institutes and community colleges to the International Union of Painters and Allied Trades. Other representative clients include Randolph Community College, Comex, Norfolk Naval Shipyard and The Ohio Department of Rehabilitation and Correction.

Future – The product set of VRSim will continue to expand horizontally across the skilled trades. Current plans are to develop learning simulations that will teach the basics of carpentry, electrical installation, masonry and structural fabrication.

Why is it innovative?

The VRSim product suite is innovative because it delivers an accurate realistic immersive user experience through a mélange of technology, intensive use of subject matter experts to create a realistic teachable experience. VRSim solves engineering and technical feasibility issues and continuously integrates input into what makes the product feel real to the instructor and the student. Armed with knowledge gleaned from instructors and trainees, VRSim's expert programming and graphical rendering cause a pixel (the smallest addressable graphical element) to interact with its surrounding pixels to bring about realistic accurate visualization of material interactions (e.g. molten metal, layered coatings, sprayed liquids, sprayed powders, etc.). It is this circular loop of constant feedback and continuous innovation that creates the unique VRSim experience. Marring new developments from diverse fields including the latest gaming innovations, sophisticated computational fluid dynamics (CFD) with deep subject matter experience, to create an innovative approach to training the skilled trades.

What did the innovation change or replace?

Virtual reality is a game changing accelerant to the training process. By engaging the students, providing them more practice time and providing objective feedback, the learning process is more effective and efficient. When added to existing training programs, students learn faster and do so while reducing the need for materials and limiting waste. For example, Randolph Community College, who purchased SimSpray in 2011, stated their students "immediately produced the quality of results usually only obtained after several weeks of traditional training." By reducing the need for materials and eliminating VOCs (volatile organic compounds), SimSpray lowered the college's cost of instructor led training and minimized the impact on the environment.

VRTEX360®



SimSpray™



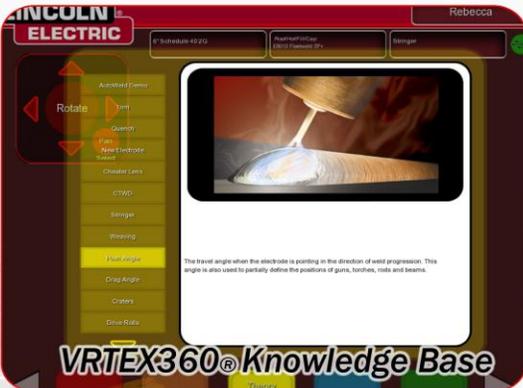
SimWelder



Painter's View



SimSpray In Action



Conveyor Environment

