

3-D Simulation for Unmanned Aircraft System Training



RTI International is developing 3-D simulation training solutions tailored for the growing field of unmanned aircraft systems. As pioneers in creating science-based education and training systems for military, law enforcement, homeland security, and commercial markets, we are using our research and technical proficiencies to create virtual environment tools that will deliver realistic learning experiences in a safe, cost-effective environment.

RTI is developing a suite of 3-D simulation training applications to address basic takeoff and landing procedures; problem resolution protocols; and in-flight operations across a variety of drone uses, including military, commercial, search and rescue, scientific research, and 3-D mapping.

Expertise in Virtual Training Tools

RTI provides education and training solutions for a variety of applications, including military vehicle maintenance, medical care, forensics continuing education programs, and public health intervention research. Our advanced technologies are based on solid science and subject matter expertise.

We use a systematic instructional design process, based on the science of learning, to guide training development. Because we incorporate sound instructional strategies and techniques within the training system, trainees can master skills more efficiently and effectively.

RTI's human factors scientists and psychologists will collaborate with multimedia graphic artists and technology experts to create realistic flight scenarios that are engaging, effective, and guided by the science of learning. Our instructional design and front-end analysis experts will

work with pilots to deconstruct the flight experience into a set of supporting tasks and duties. Using this information, our design team will develop instructional design maps that tie learning objectives directly to the critical skills needed to successfully pilot unmanned aircraft systems in a variety of situations and contexts.

The training program will match these objectives, developing foundational skills through practice and feedback before engaging in problem-based, scenario-driven vignettes that require users to demonstrate mastery of takeoff, landing, and problem resolution protocols.

Simulation Project Experience

U.S. Army Virtual Maintenance Training

RTI developed virtual maintenance simulation training to help U.S. Army soldiers make efficient repairs on the latest generation of Abrams tanks, HIMARS, and Bradley Fighting Vehicles. We have provided maintenance trainers for the Army's ground vehicles since the early 1990s, employing serious games and entertainment gaming technologies and methods to create simulations delivered via personal computers or over the web. Our approach emphasizes learning-by-doing through high-fidelity, virtual reality simulations that require students to

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perform all of the steps they would in a real-world situation and then observe the outcomes of their actions. The virtual maintenance simulations also incorporate after-action reviews, which allow trainers to highlight actions to sustain or to improve based on a review of the user's performance.

Sim-Patient™ Virtual Medical Training

RTI developed Sim-Patient (for “simulated patient”) to improve pre-hospital, primary, and emergency care by enhancing problem-based medical education, training, and practice. Using high-fidelity scenarios, we carefully design each scenario and virtual patient to meet specific learning objectives for medical personnel and provide linkages to accompanying didactic content.

Sim-Patient users are presented with case-based scenarios comprising a 3-D scene, an incident that produces trauma or other medical conditions, and up to nine patients. Users navigate through the environment to survey the scene, determine the number of casualties, and evaluate the extent of injuries by interacting and conversing with virtual patients. Users also apply medical devices, administer medications, monitor diagnostic data, and perform treatment interventions before evacuating the wounded to definitive care facilities by managing aeromedical or ground transport resources.

forensicED™ Web-based Professional Development and Continuing Education

RTI's forensicED program offers more than 30 courses for forensic professionals on topics such as medicolegal death investigation; sudden, unexplained infant death investigation; drug-facilitated sexual assault response; and breath alcohol testing. Training programs are tailored to meet the needs of various state agencies while leveraging modular design and previously developed content and workflows to maximize cost efficiency. For example, forensicED features a breath alcohol recertification training program that covers the physiology of alcohol, instrument-specific operation instructions, and interactive simulated instrument scenarios. This breath alcohol training program is delivered through an internet-based 3-D virtual environment.

RTI iShoppe® Virtual Environment

RTI iShoppe is a customized, interactive 3-D virtual convenience store environment created for in-person and web-based participation. The Tobacco iShoppe application has been customized for numerous policy-oriented studies on the point-of-sale retail environment for tobacco products. Our researchers use the tool to explore the tobacco purchasing behaviors of adults and youth in varying store contexts under differing hypothetical point-of-sale policies. Participants are randomized to a particular virtual store condition and given a shopping task to complete that exposes them to the different visual cues within the environment. We track participant attempts to purchase tobacco products and then pass them along to a follow-up survey for additional data collection. Tobacco iShoppe incorporates eye tracking to better identify which cues and areas of the store are attracting the most visual attention from participants.

More Information

Joe Eyerman
Director, Center for Security, Defense, and Safety
+1.919.541.7139
eyerman@rti.org

RTI International
3040 E. Cornwallis Road, PO Box 12194
Research Triangle Park, NC 27709-2194 USA

RTI 9343 0415



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