



Imaging, Speech Technology Boost Simulation Training

As the officer who just finished his training leaves the simulator, he whispers to his coworker: "Watch out for the big blond guy." However, when the second officer starts the training scenario, there is no big blond guy to be seen. Their department's Use of Force Training Simulator uses computer-generated images (CGI) instead of standard video scenarios, and the instructor has changed the "big blond guy" into someone small, slight, and dark-haired.

"You can use the basic scenario skeleton to change clothes, props, race, gender, and more," says Tyson Griffin of the Naval Air Warfare Center Training Systems Division (NAWCTSD), the Office of Justice Programs' National Institute of Justice's (NIJ's) partner in the creation of the Use of Forcing Training Simulator.

The simulator is expected to reach the prototype stage (prior to commercialization) by September 2008. By using CGI instead of videotaping performances by actors, the system can incorporate an array of features regarding character ethnicity, voice, gender, mood, and compliance, in addition to weather and time of day. These selections can either be generated at random or selected by an instructor, and an individual trainee's voice and actions can greatly influence the ultimate outcome. Also, because the trainer's visual system is built in a three-dimensional virtual space, the after-action review of an individual's training can be more in-depth, allowing the instructor to use the mouse to pan and scroll around and replay the scenario in three dimensions rather than be limited by the fixed field of view shot by the camera during filming.

Even more influential than the variability introduced by using CGI is the speech recognition capability built into the system.

"The officer can have a conversation with the CGI characters. An individual can be very commanding or can totally fail to control a situation through speech," Griffin says. "An officer can talk the suspect down and have a successful closing to the scenario without ever pulling a gun or using less-lethal weapons—or a situation could

blow up sky high. This is a key concept to establishing a cognitive-based approach to training as opposed to a shoot/don't shoot approach."

Affordability also played a key role in the system's design, because NIJ wanted to produce a system that smaller law enforcement agencies could afford. The agency allocated development dollars and NAWCTSD provided development expertise. When the prototype becomes available as a commercialization opportunity in September 2008, the ultimate cost to law enforcement agencies should comprise only the cost of the materials needed to build the system, a reasonable profit by the chosen vendor, and the cost to develop any new scenarios, Griffin says.

Griffin, Sunny Simmonds, and others from NAWCTSD are using the time remaining before September to fine-tune the prototype based on user feedback from testing at three sites during 2007. Existing training scenarios include an alley confrontation, a traffic stop, a domestic violence situation, and a shift-focus incident in a park. Current plans call for adding a scenario in a corrections yard or a courtroom, a street drug-selling encounter, and a school hallway episode. Along with creating these additional scenarios, developers are working on documenting the process of authoring scenarios so that in the future, law enforcement agencies could potentially produce their own role-play scenarios.

Griffin and Simmonds caution that only the largest agencies may be able to invest the time in training personnel to create scenarios, as some programming knowledge will be needed. NAWCTSD staff, however, hope to incorporate a basic artificial intelligence capability (a list of actions and responses) into the CGI characters to assist agencies in the creation of their own exercises. Also, NAWCTSD and NIJ are discussing the establishment of a central repository for all scenarios created by training system users that would be freely accessible to all law enforcement agencies that have the system.

In the meantime, the team at NAWCTSD is working on refining the existing scenarios, some of which include up to 100 different “branches,” depending on how a trainee reacts.

“Characters can have four moods, ranging from compliant to defiant,” says Simmonds. “There are also preassault indicators such as kicking a can, clenching a fist, and raising a voice when speaking. We’re working on ensuring that the characters’ gestures match their moods.”

“If you were videotaping, you would hire actors and set up your scenario. It could be a nice sunny day and shooting would go smoothly,” Griffin says. “Then, a couple of weeks later, you might realize that you need to add a branch with a knife as the actor’s weapon. You might have a hard time getting the same actors back to the same location, or it could end up being a cloudy day. By using CGI, you can make modifications as needed.”

Other refinements planned for inclusion in the commercialization prototype call for further miniaturization of the weapon module technology that would allow officers to use their own weapon and duty holster combination, and the introduction of other less-than-lethal options such as “pepper spray” in addition to service weapons and other less-lethal weapons. Even without any further refinements, the existing system can be set up and taken down in less than an hour, in a space no greater than 20 feet by 20 feet in dimension.

“It’s very easy to set up and take down. It’s very portable, and very easy to use,” says Griffin.

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