



## TACTICAL SEMI-AUTONOMOUS FORCES (TACSAF) FOR LVC

Automatically adapting scenario execution.

TACSAF is:

- Navy pilot training requires realistic simulated friendly and enemy forces.
- Today's semi-automated force (SAF) tools enable one instructor to role-play multiple entities, but SAF applications are labor intensive to operate, and expensive to develop and maintain.
- This effort is developing tools enabling end-users to author scenario requirements and to reduce operator workload by automatically adapting SAF behaviors to the requirements of individual scenarios.

Many approaches to semi-automated forces employ behavior models that require specialized personnel in one or more development phases:

- Behavior Engineering and Scenario Scripting
- Training Operations and Maintenance and Upgrades

This process is costly, and does not efficiently adapt over time to the needs of end-users, new platforms, or changes in tactics, techniques and procedures (TTPs). Specialized personnel requirements results in high support costs over the life-cycle of the product.

The Training Executive Agent (TXA) is a software agent that supports operators and training by automatically adapting scenario execution. It reasons and acts in accordance with instructor-defined training scenario context. Instructors (and scenario designers) define directives that express requirements or constraints for the execution of scenarios.

These exercise requirements may not be part of the native (pre-programmed) SAF behavior. The TXA monitors the dynamic scenario and maps its progression to the constraints and requirements within the defined directives. When a constraint or requirement violation is eminent, the TXA will enact a behavior change at the echelon, group, or individual entity's behavior in order to better match instructor intent. The TXA is founded on dynamic tailoring and supervisory control technologies.

**The TXA is being integrated into the Next Generation Threat System (NGTS).**

## HOW IT WORKS

- A user defines scenario requirements, in the form of "directives" that define scenario constraints and requirements.
- A Training Executive Agent (TXA) monitors scenario progress and executes directives when constraints or requirements may be violated.
- The TXA thus adapts SAF enemy and friendly behavior to meet the goals of the training scenario.

## WHAT IT WILL ACHIEVE

These new technologies will deliver:

- **Cost savings** in all phases of SAF construction, operation, and maintenance
- **Increased flexibility and adaptability** for simulated friendly and enemy forces
- **Tailored experience** for students of various skill levels and in support of varied pedagogical objectives



*Trainable Automated Forces (TAF)*

## RESEARCH CHALLENGES AND OPPORTUNITIES

- Automated adaptation of real-world tactics to constructive agents that continuously adjust to changing situations
- Supporting the human instructor's training goals by adapting agent behavior to influence the course of the training scenario

For further information on this exhibit, or business opportunities with ONR, please contact the Training S&T Program Officer, Human & Bioengineered Division, Warfighter Performance Department, Office of Naval Research at (703) 696-4501, or by mail at Office of Naval Research, 875 N. Randolph St., Arlington, VA 22203.

