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The Inter-Vehicle Embedded Simulation Technology (INVEST) Science and Technology Objective (STO)

INVEST STO is the lead effort in the U.S. Army Simulation Training and Instrumentation Command's (STRICOM) embedded simulation program. INVEST is a five-year effort designed to demonstrate the technology required to fully embed an advanced distributed simulation system in combat vehicles. The program goal is to provide technologies to support individual and collective training for deployed forces at battalion level and below in stand-alone and on-the-move modes.

The program is managed and funded by STRICOM's Engineering Directorate. IST is one of a contributing consortium of commercial and government agencies. The consortium includes the University of Central Florida, Science Applications International Inc. (SAIC), LinCom, Carmel Applied Technologies, Inc. (CATI), Orion Advanced Simulation and Intell Systems (OASIS), Stanford Research International (SRI), Pathfinder Systems, Inc., McDonald Research Associates, U.S. Army Tank-Automotive and Armaments Research Development and Engineering Center and U.S. Army Training Support Center.

IST's program responsibilities include technology and integration planning, Integrated Product Team (IPT) coordination,



systems integration, architecture development, applied research and independent analysis of program feasibility. Key documents to be developed and coordinated by IST include:

- **Technology Development Plan** - the plan for future research and demonstrations, updated twice annually.
- **Feasibility Analysis Study** - a continuing assessment of technological feasibility.
- **INVEST Architecture** - a comprehensive description of architectures required for INVEST implementation.
- **Systems Design and Integration Document** - establishes the system-level design,

Mission: ■ Be a focal point for the expanding modeling and simulation community ■ Develop and conduct M&S research and related services ■ Identify M&S directions and trends ■ Facilitate moving M&S into new areas ■ Be a research and development access point to industry for technology transfer ■ Create and participate in partnerships ■ Provide an environment conducive for student and faculty participation in M&S research and development ■ Provide continuing education services.

development and test requirements for the INVEST embedded simulation demonstration system.

Each document addresses, as appropriate, key technologies and components being worked by IPT members. Technologies include integrating virtual targets into live scenes, integrating simulation into tank software, injecting virtual images into tank hardware, reducing demand for simulation communications, non-laser engagement pairing and intelligent tutoring at crew level.

IST's applied research efforts in support of INVEST included work in the areas of special effects models, live/virtual aim point correlation and the evaluation of current and future low cost graphics hardware capabilities related to visual simulation and embedded training. In support of the latter, IST established a test bed to assess the image generation capabilities of low-cost, PC-based graphic cards, conducted experiments in visual simulation and embedded training, and developed tools and algorithms for embedded training systems.

IST is currently establishing a simulation integration lab to test and integrate IPT-developed INVEST components prior to final demonstrations. UCF is assisting IST's integration effort with a faculty-student team

modeling the INVEST architecture and data flows in ObjecTime.

INVEST technology advances are demonstrated annually at the Industry/Inter-Service Simulation, Training and Education Conference (I/ITSEC), the U.S. Army Armor Conference and other public forums. Final demonstrations will be conducted at Ft Hood in August 2001.

IST is working with STRICOM to plan an Embedded Simulation Advanced Concept Technology Demonstration for FY02-04. This follow-on to the embedded simulation STO would move the program from the single vehicle, technology demonstrations of the STO, to multi-platform demonstrations of employment and training concepts at the battalion level.

The technology demonstration would quickly get this capability into the hands of troops for evaluation in realistic military settings. The demonstration will refine the concept of operations for employing embedded simulation and training and will explore relevant concepts and issues of training digitized forces.

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