Air Force SBIR

Transition

An example of Air Force supported SBIR technology that has been transitioned into an Air Force or other DoD system or subsystem or used by Air Force test ranges and facilities or maintenance depots.

SBIR Topic Number:
AF99-140

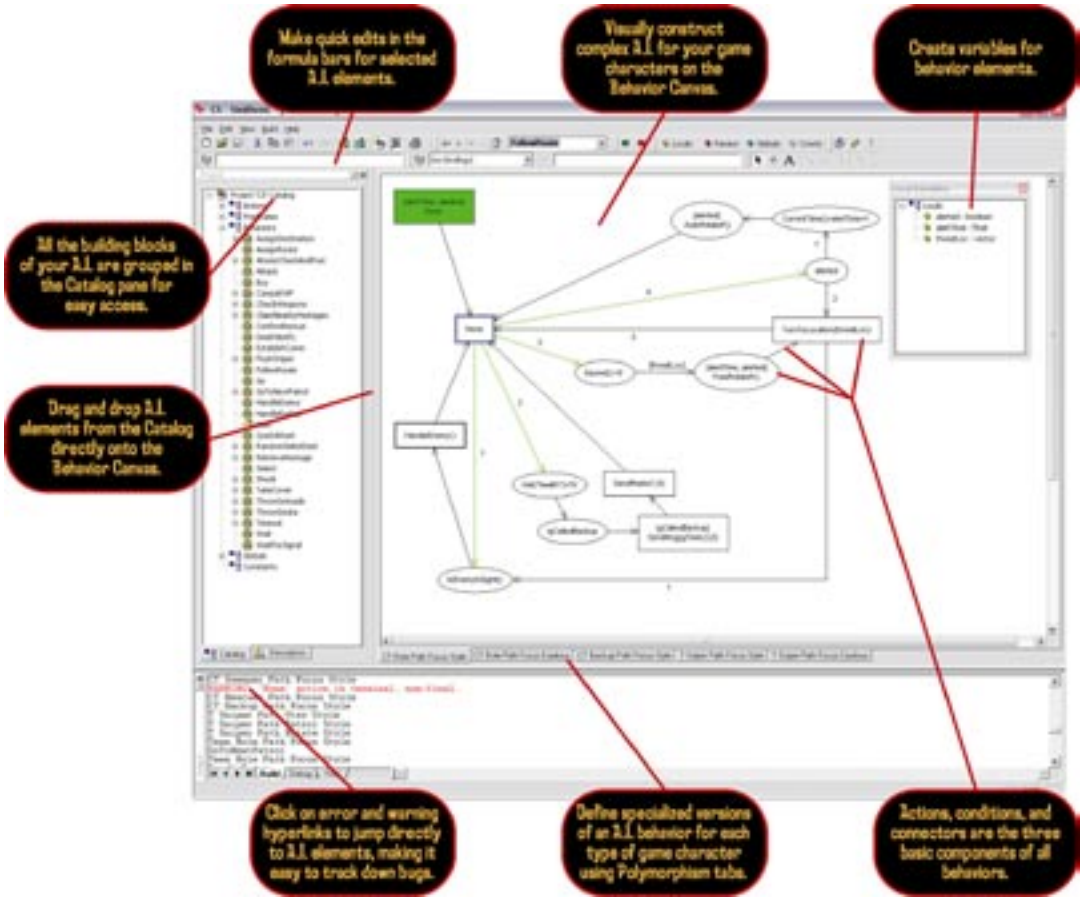
Title:
Intelligent Coordination and Control for Wargaming

Contract Number:
F30602-00-C-0036

Company Name:
Stottler Henke Corp.

Technical Project Office:
AFRL Information Directorate

Transition Office:
AFRL/IFSB



Advanced AI Tools Enable Greater Productivity for Team

- Translation barriers between subject matter experts and software developers create time consuming and costly problem in the development simulation software.
- These AI tools are now in wide use by the Air Force and by other DoD components.

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Air Force Requirements

When a development team comes together to construct a simulation, there typically exists a divide between those who have "subject matter expertise" and those who have "software expertise." These capabilities are rarely embodied in a single person; indeed, encountering someone who is a military expert and knows how to construct a simulation is a rare occurrence. The consequence of this is a translation barrier in simulation development. The subject matter expert (SME) must design the correct behavior and then explain it to a simulation developer. During testing phases, the SME must provide feedback to developers to correct and refine behavior. While there is nothing wrong with this process, it is prone to error and requires more testing and development time. The Air Force needed to address this problem.

SBIR Technology

An AI authoring package, called SimBionic, was created, with the support of SBIR contracts, to address the problem described above as well as to provide advanced AI capabilities to further accelerate the construction process across the entire team. One major goal was to enable anyone to participate directly in the design and development process. Rather than using standard software to first craft informal descriptions, SMEs employ a visual behavior representation – embodied in a software editor and runtime engine – that opens the authoring process to programmers and non-programmers alike. By modeling behaviors and simulation entities in an object-oriented fashion, this representation helps the author develop and manage the complexity of even very intricate behaviors. The author constructs behaviors by assembling flowchart-like diagrams from a set of "building blocks," including actions, conditions, and transitions between them. These behaviors can themselves be used as building blocks in other behaviors, allowing a hierarchical decomposition of complex procedures into simpler, more easily comprehensible subcomponents. A hierarchical behavior representation encourages reuse of existing behaviors, which will lead to a more maintainable system.

Air Force Transition Payoff

SimBionic is in use in a wide variety of simulation-based Intelligent Tutoring Systems (ITSs) for the Air Force as well as other DoD components. For instance, the Surface Warfare Officers School uses SimBionic with TAO ITS, which improves the tactical proficiency of tactical action officers (TAOs) via a desktop simulator with intelligent simulated forces and automated after-action review. It is also used in CAST UP ITS – which automatically evaluates Combined Arms plans and real-time simulated mission decisions for conflicts, fratricide risks, and in the Combined Arms Command & Control Tactical Upgrade System (CACCTUS) and the Future Combat System (FCS) ITS – which teaches Future Combat System robotic control vehicle crewmen tactical decision-making for employing FCS's advanced robotic capabilities.

Company Benefit

SimBionic is achieving growing recognition in the commercial game industry as an AI middleware platform, attracting considerable interest from a variety of respected game development companies. In addition, a number of academic programs in game development are currently planning to incorporate SimBionic into their curriculum, including the University of Central Florida; the Digital Media Collaboratory at the C2 Institute at University of Texas at Austin; and Digital Life Technologies at the Leiden Institute.

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