SMDC/ARSTAT

Technical Interoperability and Matrix Center

JIAM

Joint Interoperability Assessment Model

Summary

- Partitions perception from truth and propagates perception.
- Models the Joint Data Network from message creation through transmission on the modeled JTIDS and other networks to receipt and interpretation of the message. Other network architectures are simulated by the ruleset construct and message data tables.
- JIAM offers a robust suite of on-line tools for visualization and numerical diagnostics.
- Possesses an extensive independent verification and validation legacy for library-resident system models and for the common model set, which provides the "building blocks" for user construction of the system models.
- Interoperable via High Level Architecture and Distributed Interactive Simulations Processes.

Offers excellent analysis capability from subsystem through system-level and system-of-systems interoperability, including all aspects of communication for Battle Management Command, Control, Communications, Computer, and Intelligence (e.g. Integrated Air and Missile Defense) applications.

The Joint Interoperability Assessment Model is a robust, multi-purpose, event-driven modeling and simulation toolkit with emphasis on user control and flexibility. The JIAM supports modeling of systems across the full military spectrum from land-, sea-, and aerospace-based. JIAM is an object-based model providing multiple levels of detail within a single scenario, enabling emphasis to be focused in the areas of interest. Users control the simulation logic using JIAM's system-level ruleset, logic language. Scenarios, experiments, and exercises can be constructed/modified from master libraries of existing models, or they can be built "from scratch" by the users.

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The primary application for users of JIAM is detailed analysis of system interoperability. The JIAM can assist the operational commander through rapid analysis and turnaround of contingency scenarios and by providing a "real world feel" to users. It can support the combat developer through analyses focused on procedures and operation, command structure, information management, force structure, and parametric performance. It can support materiel developers through analyses focused on the relationship of system design (with emphasis on networks and interoperability) to combat value in the broad military context.

The object-based simulation architecture supports breadth and detailed analytical application, by allowing the user to completely describe and develop system models and communications networks. The user can then place numbers of these simulated interoperable systems on a host gameboard without a requirement for rewrite of other existing system models or modification of the supporting architecture. By supporting a wide range of levels of detail in model development, JIAM offers the flexibility of simultaneous use of high- and low-detail systems representations in a single simulation exercise.

This flexibility allows the analyst to apply key high-detail simulated system(s), such as a multi-tier missile defense task force at a critical location, while simulating the surrounding theater context with a lower-detail and/or higher-aggregation representation. Thus, the JIAM can simultaneously assess both system interoperability and value added at a higher echelon, reducing the need for multiple simulations and the attendant requirement for model harmonization. The JIAM software and ruleset language has been prepared to model Integrated Air and Missile Defense (IAMD) systems at a similarly wide range and level of detailed, interoperable systems and IAMD weapon system elements. Sensor information can be processed by candidate plug-in algorithms and logic evaluated for advanced sensor/track data handling techniques.

By placing model-development power in the hands of users, the JIAM has stimulated the ongoing development of a range of system models. JIAM models have been verified and validated for specific uses which serve as a cost-effective baseline for use/extension into other analysis and study areas.

JIAM model libraries, combined with Distributed Interactive Simulation (DIS) and High Level Architecture (HLA) capability, offers a number of benefits to DIS/HLA exercises. An analyst assembling the elements of such an exercise can build a synthetic environment on the JIAM gameboard to support live, virtual, and high fidelity constructive participants. If the participation of another simulation is not available for any reason, the analyst can substitute for the missing element with approved system representations. In addition, the model libraries contain representations of critical elements such as Command, Control, and Communication (C3) sites, which can be added to support interoperability among diverse participants.

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