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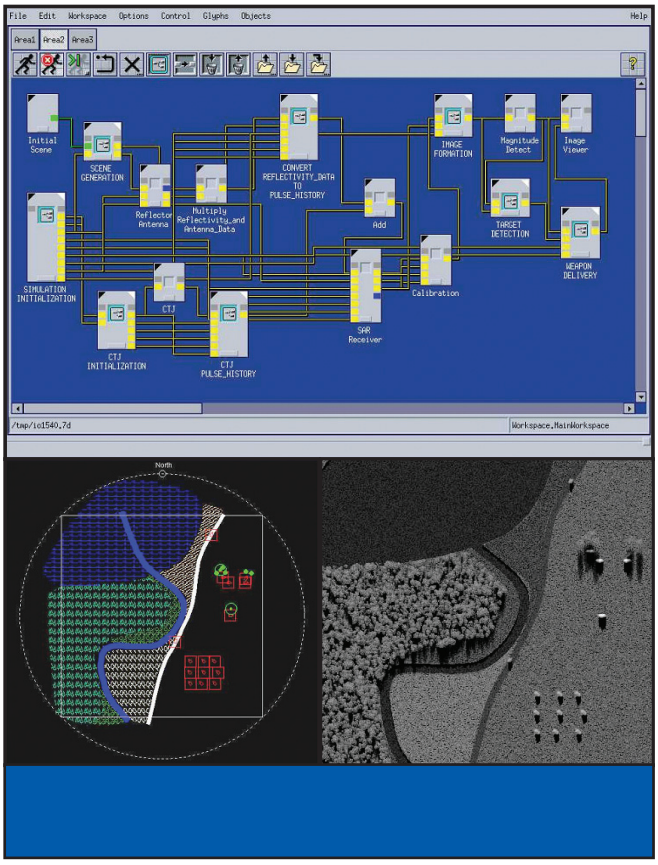
Science and Technology for Tomorrow's Aerospace Forces

Success Story

THE INTEGRATED PRECISION SYNTHETIC APERTURE RADAR TARGETING SYSTEM



The Integrated Precision Synthetic Aperture Radar Targeting (IPSART) system is a user-friendly system that allows researchers to design, analyze, and develop synthetic aperture radar (SAR) targeting techniques with greater precision and at a faster rate. In addition, IPSART is a learning tool for users with various levels of radar experience. Engineers can use this tool to perform collaborative work with other agencies and laboratories to produce new technologies and improve current capabilities in multiple disciplines.

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Accomplishment

Researchers at the Sensors Directorate developed IPSART, an innovative design tool for modeling and analysis of airborne radar system performance for precision SAR targeting. IPSART allows research and development organizations at various locations to perform collaborative engineering.

Background

High-resolution SAR targeting capability is vital for precision-strike mission success. In difficult electronic countermeasure environments, increasingly sophisticated enemy defenses require fire control information derived from highly maneuverable aircraft trajectories rather than traditional straight-and-level flight.

These imaging and targeting conditions impose severe performance requirements on the sensor's aircraft motion compensation system and dictate the need for sophisticated algorithms to counteract the electromagnetic compatibility threats. The IPSART system develops a high fidelity end-to-end simulation for realistic SAR targeting in a hostile environment for a highly maneuverable tactical aircraft.

In order to simulate a complex environment, this system must model a spotlight SAR, a trajectory generator, and coherent jamming. IPSART generates synthetic images, which will allow software designers to determine the best method in designing, developing, or analyzing SAR targeting capability on current or new SAR systems.

The IPSART tool uses the Cantata graphical user interface to provide user-friendly operations for a large number of researchers and support a variety of experiments. Cantata is a data flow visual programming language, which enables the developer to generate a workspace by connecting several functional modules to form a data flow graph.

Sensors
Support to the Warfighter

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTT, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (01-SN-13)