



Geographic Information Integration and Generation Tools

Problem

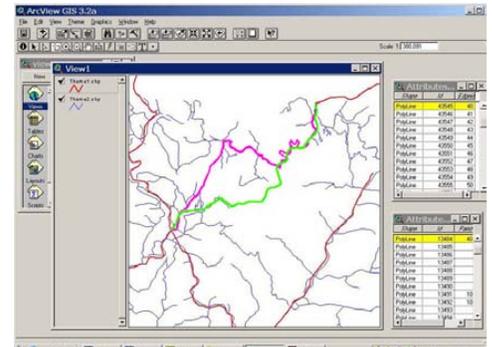
The compilation of spatial map information is a manual, expensive, error-prone process that historically has been the responsibility of large Government agencies using carefully-controlled single sensor imagery. The past 15 years have brought dramatic changes to mapping technology. Today, high quality spatial information may be produced by state, local, commercial organizations and even private citizens. Input data sources range from the conventional to hyper-spectral to unmanned air vehicles to cellular phones. The exploitation of spatial map information from multiple sources results in a disturbing reality: multi-source data over the same geographical area are disparate, both spatially and thematically. The disparity can be due to scale, resolution, compilation standards, operator license, source accuracy, registration, sensor characteristics, currency, temporality, or errors.

**Description of
Research**

Geographic Information Integration and Generation Tools (GIIGT) is an U.S. Army Scientific and Technical Objective Research Initiative for FY2003-2006. Methods for registering multi-sensor imagery using automatic image edge correlation have been developed and are being evaluated for transition. Algorithms to merge elevation data from imagery, laser, and radar methods are being developed and tested. An automatic system which matches multiple vector features across differing map sources and performs “feature linking” can produce a “best map” is being sponsored. Other efforts involve the developments of an object-oriented spatial management model and spatial data mining software.

Expected Products

Tools are being developed that will automatically integrate, manage and exploit multi-source imagery, elevation data, and spatial features. GIIGT is addressing these technical problems by developing automated techniques to register multi-sensor imagery. Methods for integrating Digital Elevation Models from passive and active sensors are being tested, as are methods for handling disparate vector feature and attribution data. Methods for managing, exploiting, mining, and verifying multi-source data are further challenges being addressed.



Potential Users

GIIGT tools are intended for use by Army and other DOD users with complex mapping requirements based on multi-sensor imagery.

Projected Benefits

GIIGT will automatically integrate, manage, and exploit multi-source imagery, elevation data, and spatial features. The automated techniques will yield time and cost savings, but more importantly, they will offer a new capability — to compile spatial maps that reflect multiple (previously disparate) data sources.

Program Manager

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