

**PACKAGE ID** - 001156SPARC00 DIAS1.05.3

**KWIC TITLE** - Dynamic Information Architecture System

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**LIMITATION CODE** -COPY                   **AUDIENCE CODE** - LIM

**COMPLETION DATE** - 01/01/1996   **PUBLICATION DATE** - 01/01/1996

**DESCRIPTION** - The Dynamic Information System (DIAS) is a flexible object-based software framework for concurrent, multidisciplinary modeling of arbitrary (but related) processes. These processes are modeled as interrelated actions caused by and affecting the collection of diverse real-world objects represented in a simulation. The DIAS architecture allows independent process models to work together harmoniously in the same frame of reference and provides a wide range of data ingestion and output capabilities, including Geographic Information System (GIS) type map-based displays and photorealistic visualization of simulations in progress. In the DIAS implementation of the object-based approach, software objects carry within them not only the data which describe their static characteristics, but also the methods, or functions, which describe their dynamic behaviors. There are two categories of objects: (1) Entity objects which have real-world counterparts and are the actors in a simulation, and (2) Software infrastructure objects which make it possible to carry out the simulations. The Entity objects contain lists of Aspect objects, each of which addresses a single aspect of the Entity's behavior. For example, a DIAS Stream Entity representing a section of a river can have many aspects corresponding to its behavior in terms of hydrology (as a drainage system component), navigation (as a link in a waterborne transportation system), meteorology (in terms of moisture, heat, and momentum exchange with the atmospheric boundary layer), and visualization (for photorealistic visualization or map type displays), etc. This makes it possible for each real-world object to exhibit any or all of its unique behaviors within the context of a single simulation.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; Media Includes Source Code;

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - 3 3.5 Diskettes

**METHOD OF SOLUTION** - A flexible and extensible object-based representation of concrete and abstract objects populating an area of interest is created. Process models and other software

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**METHOD OF SOLUTION - (CONT)** applications are linked to these objects and various aspects of the objects dynamic behavior are provided. A true object database handles the necessary data management, and an object based GIS component carries out the inspection, visualization, and manipulation of data in the prescribed area of interest.

**COMPUTER** - SUN SPARC

**OPERATING SYSTEMS** - UNIX (Sun Solaris Version 2.4 or later)

**PROGRAMMING LANGUAGES** - Smalltalk (80%), C++ (20%)

**SOFTWARE LIMITATIONS** - The size and complexity of a DIAS representation is limited only by the amount of main memory and disk storage space available. There are no preset size limits in the DIAS database schema.

**SOURCE CODE AVAILABLE (Y/N)** - Y

**UNIQUE FEATURES** - DIAS provides a unique combination of capabilities in multidisciplinary modeling and geographic information management. The object-based architecture of the software is extremely flexible and extensible.

**RELATED SOFTWARE** - DEEM

**OTHER PROG/OPER SYS INFO** - The current prototype requires use of the proprietary Versant Object Database Management System from Versant Object Technology Corporation and the proprietary Smalltalk language environment Version 2.51 from ParcPlace-Digitalk Visual Works.

**HARDWARE REQS** - Unix workstation with a minimum of 64 Mbytes of RAM.

**TIME REQUIREMENTS** - Running time is completely dependent on the simulation represented. Contributing factors include complexity of the region being modeled, the specific behavior models executed, desired spatial and temporal resolution, etc.

**ABSTRACT STATUS** - Submitted 2/18/97. Released AS-IS 4/30/97

**SUBJECT CLASS CODE** - PR

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
D CODES  
COMPUTERIZED SIMULATION  
DATA ANALYSIS  
MAPPING  
TOPOGRAPHY

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COMPUTER CALCULATIONS  
GEOGRAPHY  
METEOROLOGY  
SITE CHARACTERIZATION

**EDB SUBJECT CATEGORIES** -  
990200 580000 540000

**SPONSOR** - DOE/ER

**PACKAGE TYPE** - AS - IS