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INSTALLING A COPY OF THE
ARPA/DMA IMAGE UNDERSTANDING TESTBED AT THE
U. S. ARMY ENGINEER TOPOGRAPHIC LABORATORIES

Semiannual Technical Report
Covering the Period 30 July 1983 through 31 December 1983

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SUMMARY

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The principal objective of this effort is to establish a functional copy of the SRI Image Understanding (IU) Testbed system of hardware and software at the U. S. Army Engineer Topographic Laboratories (ETL) Research Institute at Fort Belvoir, Virginia. Initial tasks included advising on the preparation of the ETL site for the Testbed system installation, purchasing the required hardware and arranging for installation at ETL, and arranging for availability of Testbed software systems. Recent major tasks included assisting with several phases of hardware installation and testing, installing Testbed software systems, and developing support software to enhance the system's overall capabilities of the system. The ETL system is now functional as a node on the DDN MILNET network and interacts with a Symbolics Lisp Machine over a Chaosnet/Ethernet network. The main beneficial result of this effort is the transfer to ETL of a large body of research technology carried out by SRI and numerous other contributors to the DARPA Image Understanding research program.

I INTRODUCTION

The ARPA/DMA Image Understanding Testbed system was established at SRI to provide a framework for evaluating and demonstrating the applicability of IU research results to automated cartography. A number of software systems were contributed to the Testbed by participants in the DARPA IU research program; these systems were adapted to the SRI environment and numerous additional utilities were generated at SRI specifically for the Testbed. These efforts have resulted in a system that allows the transfer of research technology to other sites for the purpose of evaluation.

The objective of installing a copy of the IU Testbed at ETL is to carry out such a transfer of technology. The acquisition of a Testbed copy significantly enhances the capabilities of ETL for evaluating and adapting Testbed software and Testbed environment features to specific problem areas. ETL personnel are now able to work directly with contributed IU research software and to study the implications of employing such techniques for cartographic tasks. In addition, the close association of ETL with the cartographic-production branches of DMA enables them to cooperate in analyzing DMA's typical application and user interface requirements.

II PROGRESS

As of the date of this report, we have enhanced the ETL Testbed copy system installed in May of 1983 by adding several network capabilities and a major software update. Significant progress was made during a visit to ETL by the SRI project leader, Andrew Hanson, from December 6 through December 9, 1983.

The following tasks were carried out during this report period:

- * Acquisition and installation of DDN MILNET hardware and software; the ETL Testbed is now fully operational as a DDN MILNET network node known as ETL-AI.
- * Installation of a Symbolics Lisp Machine along with the hardware and software necessary to enable it to communicate with the ETL Testbed VAX as a Chaosnet network node.
- * Installation and configuration of a new set of RA81 Winchester disk drives on the system.
- * Update of the VMS operating-system software.
- * Installation of digitizing-tablet hardware and software.
- * Major reorganization and update of the IU Testbed system itself; the libraries have been significantly improved and several new program systems added, while a number of bugs and problems have been fixed.

The following items of equipment have been purchased and installed for the project as of this date:

- * VAX 11/780 computer system.
- * Grinnell GMR-275 image-processing system.
- * 19" color monitor, 15" monochrome monitor, three 12" monochrome monitors.
- * Versatec V-80 printer/plotter and stand.
- * Datamedia computer terminals.
- * Optronics C-4100 color film scanner.
- * Additional large-capacity disk drive system.
- * Digitizing tablet with SRI mouse-function PROM.

In addition, the following one-year service contracts have been acquired:

- * VAX 11/780 system hardware maintenance contract
- * VAX 11/780 system software maintenance contract
- * Versatec V-80 hardware maintenance contract.

III PLANS

As desired by ETL, we shall continue to provide advice and conduct tutorials on management and use of the system. We shall also continue to discuss those areas in which ETL needs further support and software development so as to take full advantage of the system. We will continue to plan for future support activities and tasks to be incorporated into the ETL Testbed copy effort. In particular, guidance on the use of the new Symbolics Lisp Machine at ETL will be furnished as appropriate.

Among the additional items of equipment that we plan to obtain to complete the requirements of the ETL Testbed copy system are the following:

- * Color film hard-copy recording device.
- * Additional large-screen text terminals to support additional users.
- * High-speed teletype interface card to support the above terminals.
- * Other minor supporting equipment, as required.

We also intend to investigate several types of stereographic display systems for possible inclusion in the SRI Testbed; if a suitable system is found, we shall consult with ETL about the desirability of procuring a similar system for the ETL Testbed.

Specific software enhancement tasks we plan to examine during the remainder of the project include the following:

- * Incorporation of Berkeley UNIX 4.2BSD software into the Testbed system when it becomes available.
- * Rewriting portions of the SRI road tracker system for use with the ETL Grinnell display.
- * Incorporation of more sophisticated pointing devices into the system utilities.
- * Incorporation of graphics support for the Lisp Machine.
- * Incorporation of graphics support for non-Grinnell devices.

SRI plans to continue its close contact with the ETL Testbed copy system to facilitate future transfer of machine vision technology. ETL will thus be able to evaluate and experiment with current IU research concepts in an efficient manner.