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

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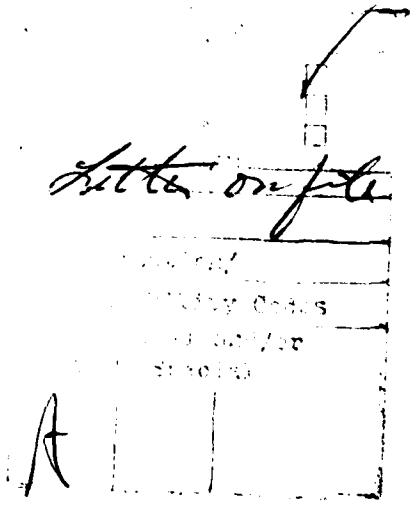

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SUMMARY

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. Major tasks to date have consisted of 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. Upcoming tasks include assisting with hardware installation and testing, installing Testbed software systems, acquisition of additional hardware, and developing support software to enhance the overall capabilities of the system. The main beneficial result of this effort will be 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 will significantly enhance the capabilities of ETL for evaluating and adapting Testbed software and Testbed environment features to specific problem areas. ETL personnel will be 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 will enable them to cooperate closely in analyzing the application and user interface requirements that are representative of DMA's needs.

II PROGRESS

As of the date of this report, we have carried out several tasks involved in the installation of an IU Testbed copy at ETL.

We have provided advice and guidance on a number of issues that must be resolved prior to the establishment of a Testbed copy at ETL. Among such issues are the following:

* Specification of site preparation requirements, including those concerned with physical space, power, and cooling.
* Identification of software licenses and approvals necessary to enable installation of proprietary software contained in the Testbed system; included were the acquisition of a UNIX license, a EUNICE license, and permission to use the VAX EMACS editor system.
* Determination of requirements for becoming a node on the ARPANET, including hardware specifications.

We have ordered the following items of equipment specified in the proposed first increment of funding for the project:

* VAX 11/780 computer system (received, not installed or tested).
* Grinnell GMR-275 image processing system (received, tested but not installed).
* 19" color monitor, 15" monochrome monitor, 12" monochrome monitor (received).
* Versatec V-80 printer/plotter (received, tested but not installed); support stand (back-ordered, not received).
* Datamedia computer terminals (received, tested but not installed).

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 maintanence contract.

SRI personnel have been in frequent contact with ETL personnel regarding the issues involved in planning for system installation.

III PLANS

Installation of the delivered hardware will be completed after the VAX 11/780 computer and its operating system have been installed. The VAX installation is expected to be finished by mid-January.

When the VAX computer system is installed and verified to be functioning properly, SRI project personnel will travel to ETL to complete the initial installation of the Testbed hardware and software systems. In particular, we shall carry out the following steps:

* Inspect and confirm the VAX installation and functionality.
* Install and test the Grinnell display system, the Versatec printer/plotter, the monitors, and the computer terminals.
* Install and test the EUNICE UNIX emulation system.
* Install and test the ARPANET system.
* Install and test the current versions of the IU Testbed applications and utility software.

Once the basic Testbed system is installed and functioning, we shall, if desired by ETL, conduct tutorials on the management and usage of the system. We shall also discuss the areas in which ETL needs further support and software development in order to take full advantage of the system. Plans will be laid for future support activities and tasks to be incorporated into the ETL Testbed copy effort.

Upon receipt of the next increment of funding for this project, we shall enter into the second proposed phase of equipment procurement and shall enhance the power of the ETL system to match that being developed in parallel at SRI. In particular, we plan to add the following equipment items to the ETL system:

* Two or more interactive digitizing systems; a survey of appropriate vendors is currently in progress.
* Increased disk capacity for the VAX 11/780 computer system.

* Additional monitors to enable remote use and sharing of the system graphics capabilities.
* An optical film scanner to enable the digitization of photographic imagery.
* A video crossbar to support dynamic sharing of graphics resources.
* A film recorder to record the results of image processing on slides and other photographic media.

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 will consult with ETL about the desirability of obtaining a similar system for the ETL Testbed.

Specific software enhancement tasks we plan to undertake in the course of the project include the following:

* Upgrading the graphics access system to a device-independent protocol, so that Testbed applications programs may be run on devices other than the Grinnell.
* Development of a compatible LISP graphics protocol that can be used either with FRANZ LISP on the VAX with the proposed device-independent graphics system, or with the SRI Lisp Machine systems; note that a Lisp Machine system will be incorporated into the ETL Testbed system at a later time as part of a previous SRI DARPA contract.
* Addition of utilities for manipulating images.
* Incorporation of Berkeley UNIX 4.2BSD software into the Testbed system when it becomes available.

In general, SRI plans to maintain close contact with the ETL Testbed copy system to facilitate the transfer of machine vision technology. As a result, ETL will be able to evaluate and experiment with current IU research concepts in an efficient manner.