# *Introduction*

## Overview

NCSA Collage software provides the scientific research community with a collection of integrated data analysis tools which may be used to further the understanding of objects or phenomena represented by data sets. These tools include visualization, animation, auditory, and color editing techniques which may be utilized in either single or multiple-user contexts. NCSA Collage software is implemented on three platforms:

- UNIX computers running the X Window System
- Macintosh computers
- PC computers running Microsoft Windows

The auditory analysis tools, called sonification, however, are only available on the Microsoft Windows platform.

NCSA Collage for the X Window System provides image display and analysis, color table editing, and spreadsheet display of floating-point numbers in much the same way that NCSA XImage did in the past. Data handling in NCSA Collage is more integrated and transmitting modified color tables, data sets, and images via the clipboard or file system to the other applications is no longer necessary.

Through the use of *associations*, changes to any piece of data have an instant effect on related data. For example, highlighting an area on a raster image will highlight the corresponding data in its related spreadsheet. Modifying a color table automatically updates its related raster image to display any color changes. Associations provide a way for researchers to quickly correlate relations in their data.

Using NCSA Collage in the multiple-user context, called *collaboration*, features an "on-line brainstorming" capability enabling researchers at separate locations to share simultaneous data analysis operations, including display graphics, messages, drawings, and file editing.

The additions of collaborative use and sonification have provided truly new techniques for data analysis. Suggestions from many individuals contributed to the development of this software and if you find the use of this software rewarding in your work, please let us know. Comments and suggestions help us continue to develop new tools like NCSA Collage.

## About NCSA Collage

NCSA Collage for the X Window System is an imaging and data analysis tool. It was developed for analysis of three-dimensional 32-bit floating-point scientific data stored in NCSA HDF file format. The current release of NCSA Collage for the X Window System is 1.2.1, and it features:

- Color raster display of 2D slices from 3D datasets
- Display of actual data values in spreadsheet form
- Synchronized selection between corresponding image and data windows
- Continuous and single-step animation of color raster images
- Manual frame control, frame skipping, auto-reverse, and asynchronous discontinuation animation capabilities
- Tiling of multiple images in a single window
- Arbitrary 2D slice selection from 3D data
- Interpolation of color raster images
- Support for user-defined, raw color palettes, such as those created in NCSA PalEdit
- Screen capture operation
- Interactive white board, text editor, and annotation tools
- Collaborative display of data between multiple users

## Organization of This Manual

This manual provides a explanation of NCSA Collage, starting with introductory matter such as its functional capabilities, an overview of a basic procedures, and roadmaps which guide the user through a number of paths through the software tools. Having this introduction, detailed procedures are then presented for all the major areas of the software.

The contents of this manual are as follows:

- Conceptual Overview:

Chapter 1, "NCSA Collage - An Overview," provides an introduction to the basic concepts and features of the application. It describes the program's visualization, animation, color editing, and collaboration capabilities.

- Basic Procedures:

Chapter 2, "Basic Procedures," describes the basic procedures for handling data files, printing data, saving data, and using the data analysis and drawing tools.

- In-Depth Procedures:

Chapter 3, "Spreadsheets," details image generation techniques and use of three dimensional spreadsheets.

Chapter 4, "Visualization," describes data visualization through the use of raster images, their tools, and controls.

Chapter 5, "Color Tables and the Palette Editor," describes the use and manipulation of the color tables.

Chapter 6, "Collaboration," further describes collaborative uses between multiple users.

- Miscellaneous Information:

Appendix A, "Glossary," contains a list of terms and definitions.

Appendix B, "Windows and Menus," contains a list of all windows and menus in the application.

Appendix C, "X Resources Used by NCSA Collage," lists the X resources that can be modified by the user.

Appendix D, "Using DTM," describes how DTM is used to communicate information with NCSA Collage.

Appendix E, "References," lists references for other documents related to NCSA Collage.

Appendix F, "Error Messages," lists error messages from NCSA Collage.

Appendix G, "Known Problems," lists known problems with the NCSA Collage.

## Conventions Used in This Manual

### Terms and Variables

In explaining various features, this manual often presents a word within a paragraph in *italics* to indicate it is a new term defined within the paragraph or it is a variable for a command.

### Screen Displays

Screen displays in this manual are presented in `typewriter type`. This type represents output information from an application or input data for an application.

### Entry Format, Commands and File Names

Throughout this manual, several explanations instruct you to make entries by typing on the keyboard to enter a command or file name. These entry instructions are printed in **`typewriter bold type`** and appear within a screen display, paragraph, or on a separate line.

### Cross References

Portions of this manual refer to other sections or chapters of the manual where related topics are discussed. These cross references usually indicate the title of sections or chapters enclosed in quotation marks, such as, See Chapter 1, "Getting Started."

# Installation

## System Requirements

NCSA Collage for the X Window System is available in executable form for several platforms. Supported platforms include:

- Sun SPARC running SunOS
- IBM RS6000 running AIX
- DEC DECstation running Ultrix
- DEC Alpha running OSF/1
- SGI running IRIX
- HP 700 series running HP/UX

You will need approximately 4.5 MB of disk space to store NCSA Collage and NCSA Collage Server applications. NCSA Collage requires X Window System Release 11.4 or 11.5 for all platforms.

Depending on the size of your data, the amount of RAM you need to run NCSA Collage varies. It is suggested that you have a total of 8 MB of RAM for smaller data sets and 12 MB of RAM or more for larger data sets.

Contact NCSA if your system is not listed above. Source code for NCSA Collage can be provided for compilation on other computer systems. To compile NCSA Collage on your system, you will need X Window System Release 11.4 source and libraries and Motif 1.1.

## Display Requirements

NCSA Collage requires a pseudocolor 8-bit display system. NCSA Collage will not operate on a black & white or gray scale display.

Some users of 24-bit display systems, such as SGI machines, may need to configure their displays for 8-bit operation. Configuration instructions are described in Chapter 2, "Basic Procedures."

## Networking Requirements

If you plan to use NCSA Collage in multiuser collaborative sessions, you need machines that are connected to an Ethernet network. Ethernet is not required for single-user use of NCSA Collage.

## Installing NCSA Collage

NCSA Collage is available in executable form from the NCSA anonymous ftp server system `ftp.ncsa.uiuc.edu` in the directory **`/UNIX/XCollage/Collage1.2.1`** Anyone may log into the server with logon name **`anonymous`** and your e-mail address entered for the password. You will need two files from the NCSA anonymous ftp server: **`collage`** and **`collage_server`**. The **`collage_server`** file name will be in the format **`collage_server.`*`machinetype`*`.Z`**, such as **`collage_server.sn4.Z`** for Sun 4 (SPARC) systems; **`collage`** filenames follow the same convention. Once you download the files, uncompress them and rename the resulting files using the **`mv`** command:

```
uncompress collage.sn4.Z
uncompress collage_server.sn4.Z
mv collage.sn4 collage
mv collage_server.sn4 collage_server
```

After downloading the files by **`ftp`** in binary mode, move the **`collage`** and **`collage_server`** executable files to a directory in your `$PATH` variable. Typically, executables are located in a bin directory such as **`/bin`**, **`/sbin`**, **`/usr/bin`**, or **`/usr/local/bin`**. Ensure that the files are executable using the **`chmod`** command:

```
chmod 755 collage collage_server
```

You have now completed the installation of NCSA Collage.

## User Interface

The graphical user interface for NCSA Collage is Motif. If you are not familiar with Motif conventions, please refer to the references listed in Appendix E, "References," for more information about Motif and the X Window System.

## Configuring Your X Environment

NCSA Collage contains X resources that can be configured to match the needs of the user, such as display font sizes. If you are an experienced X Window System users, you can configure these X resources yourself, or consult your local system administrator for assistance. These resources are described in Appendix C, "X Resources Used by NCSA Collage."

## Configuring Your Data Files

The preferred format for data files is Hierarchical Data Format (HDF). If you need to convert your data into HDF, more information is given in Chapter 2, "Basic Procedures," and Appendix E, "References."

## Sample Data Files

NCSA provides several sample data files to use with NCSA Collage. These files can be found on the NCSA anonymous ftp server system `ftp.ncsa.uiuc.edu` in the directory **`/Samples`**. Whenever possible, try to use these files while learning how to use NCSA Collage. These files are especially helpful if you have not had experience with HDF files. Some of these sample data files were used to create the example illustrations in this manual.