Preface

The purpose of the MIPAV software program is to allow medical researchers to extract quantitative information from image datasets of various medical image modalities.

Scope of this guide

The primary purpose of the *MIPAV User's Guide* is to provide medical researchers the information they need to use the MIPAV software program.

A secondary goal is to give researchers the information needed to extend, if desired, the software's capabilities through the development of new functions in plug-in applications via use of the software's application program interface (API).

Who should use this guide

Medical researchers, medical technicians, and other people who are involved in analyzing medical images or maintaining and supporting the equipment used to produce images form the audience for the *User's Guide*.

12/2/08

M I P A V
Medical Image Processing Analysis & Visualization

Skills you need to perform tasks in MIPAV

Depending on the platform—Windows, MacIntosh, or Unix—that is running your workstation, it is recommended that you are familiar with installing and using software programs for that platform.

If you plan to create plug-in applications for MIPAV to add new functionality, you must have software programming skills and be familiar with Java.

How this guide is organized

The *MIPAV User's Guide* is divided into two volumes:

- Volume 1, *Basics,* explains how to use the basic features and functions of MIPAV and how to incorporate plug-in applications.
- Volume 2, *Algorithms,* presents detailed information about the purpose, background, and function of the algorithms packaged with MIPAV and gives instructions for using them.

Volume 1, Basics

The *MIPAV User's Guide*, Volume 1, *Basics,* includes the following:

- Chapter 1, "Introducing MIPAV," presents an overview of the MIPAV software program.
- Chapter 2, "Installing MIPAV," explains how to install, remove, and upgrade the MIPAV software program. It also explains how to subscribe to the MIPAV mail list and how to search the MIPAV archive.
- Chapter 3, "Getting Started Quickly with MIPAV," explains how to use MIPAV to perform common functions, such as opening an image file, saving the file, and printing a log file.
- Chapter 4, "Understanding Image Basics," provides background information on image file formats. It also provides information on how to view and adjust image file attributes.

- Chapter 5, "Working with DICOM Images," explains how to access DICOM databases, perform queries, and retrieve image files. In addition, it explains how to send files to a database.

- Chapter 6 "Connecting to SRB BIRN" explains how to connect to SRB BIRN.

- Chapter 7 "NDAR Imaging Import," provides the help for the NDAR Imaging Import tool, which is designed to assist uses in moving data from the MIPAV XML output to the NDAR shared data repository for the benefit of the greater autism community.

- Chapter 8, "Visualizing Images," provides instruction on how to customize the way image files are displayed, how to magnify and minify images, how to view images together, how to view a portion of the image, and how to change image brightness and contrast by generating histograms and adjusting color look-up tables (LUTs).

- Chapter 9, "Segmenting Images Using Contours and Masks," explains how to create, group, rearrange, and modify volumes of interest (VOIs); how to create masks; and how to use paint to further identify VOIs.

- Chapter 10, "Analyzing Images," discusses how to calculate statistics for VOIs and masks and how to generate intensity profiles, or graphs, for images.

- Chapter 11, "Changing Image Datasets Using MIPAV Utilities . . .," explains how to use the utilities included in the software.

- Chapter 12, "Using Scripts (Macros) in MIPAV," describes how to develop scripts, which you can use to customize the program.

- Chapter 13, "Developing Plug-in Programs," and Appendix D explain how to incorporate plug-in programs into MIPAV.

- Chapter 14, "Technical support" on page 594 provides information about MIPAV technical support and also explains how to use the debug mode.

- Appendix A, "References," provides a list of references that can be used to learn more about MIPAV functions.

- Appendix B, "DICOM Conformance Statement," provides a copy of the formal DICOM Conformance Statement, which specifies MIPAV's

service classes, information objects, communications protocols, and media storage application profiles.

- Appendix C, "Supported formats" on page 627 lists graphical and file formats supported by MIPAV. It also provides examples of MIPAV system files (such as the preference file) and explains how the user can interpret them; provides limited instruction on how to modify specific files.
- Appendix D, "PluginAlgorithmMedian" gives an example of MIPAV plug in.

The guide also includes a glossary of terms and acronyms.

Volume 2, Algorithms

Volume 2, *Algorithms,* includes two chapters:

- "Understanding MIPAV capabilities," which discusses the tools and application programming interface provided with MIPAV
- "Using MIPAV Algorithms," provides detailed information about the algorithms packaged in MIPAV

In addition, the book includes the glossary of terms and acronyms.

Where to find more information

Both volumes 1 and 2 of the *MIPAV User's Guide* are available as Acrobat PDF files, which you can view, download, and print. You can either print each volume, or you can print individual chapters separately. For PDFs of this guide, go to the MIPAV web site:

http://mipav.cit.nih.gov

Conventions used in this guide

This guide uses the following conventions:

This convention . . .	Stands for . . .
Italics	Names of books, guides, or manuals as references
	New terms or emphasis
	Names of executable files
Bold	User input
	Names of programming commands
All caps	File types, such as TIFF, GIF, or JPG
Upper- and lowercase	Names of keys
name@address.com	E-mail address format
Hyperlink	An internet link (position the cursor on this word and click the left mouse button)*
Monospace	Code sample, including keywords and variables within text and as separate paragraphs, and user-defined program elements within text

*All figure and table citations, such as Figure 1 or Table 1, are hyperlinks although they are not underscored. Clicking the citation displays the appropriate figure or table.

Both volumes of the *MIPAV User's Guide* include special information that briefly highlights particular features or functions or that provide clarification. Based on the type of information they convey, these notes are labeled "note," "tip," "example," "recommendation," "remember," "reference," "caution," and "disclaimer." The following examples indicate how these notes appear and the type of information they include.

Note: Notes provide additional information that is related to the subject at hand. They tend to be "by the way" types of information or asides.

Tip: Tip paragraphs point out application shortcuts or briefly describe special features of the software.

Example: An example paragraph provides an example of a task or incident in which something of note could occur.

Recommendation: Paragraphs that are labeled "Recommendation" suggest methods of good practice or advice.

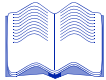**Definition:** The definitions of specific words or phrases of note appear in "definition" paragraphs.

Remember: Notes labeled "Remember" present information that was previously discussed and that is pertinent in the current topic.

Reference: A reference note highlights one or more references that contain information on the current topic.

Caution: A paragraph labeled "Caution," alerts you to be very careful about avoiding some action that could harm your equipment or data.

Disclaimer: A disclaimer indicates the possible limitations or ramifications of a topic.