IMMerge™

Multiple 3D Images Merging Software

Reference Guide Version 8.0 for Windows
July 2003

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Introduction

The IMMerge Reference Guide 8.0 is intended for users of IMMerge Version 8.0 for Windows. IMMerge is a software tool that merges a set of 3D images into a unified polygonal mesh.

Contents of the IMMerge Reference Guide 8.0

This document contains one section:

- **1. Using IMMerge**

  This section presents IMMerge, a fully automated software tool that merges multiple 3D images into a global polygonal surface.

Related documentation

The PolyWorks Reference Guide presents the PolyWorks software suite, describes the installation procedure, and shows how to invoke IMMerge from the PolyWorks interface.

Technical support

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1. Using IMMerge

IMMerge is a completely automated software tool for merging a set of aligned 3D images into a global surface triangulation model. IMMerge only requires the setting of two intuitive geometrical parameters. In addition to being an automated process, IMMerge can merge any number of 3D images for any kind of object topology.

IMMerge is accessed from the **IMMerge** tab of the PolyWorks Module Access Center, shown in Figure 1.1. IMMerge is also a command-line program (see Section 1.5 for complete information). Please ensure that IMMerge has been properly installed on your system. The installation procedure is described in Appendix A of the PolyWorks Reference Guide.

This section describes each parameter in the IMMerge interface, and recommends values where appropriate.

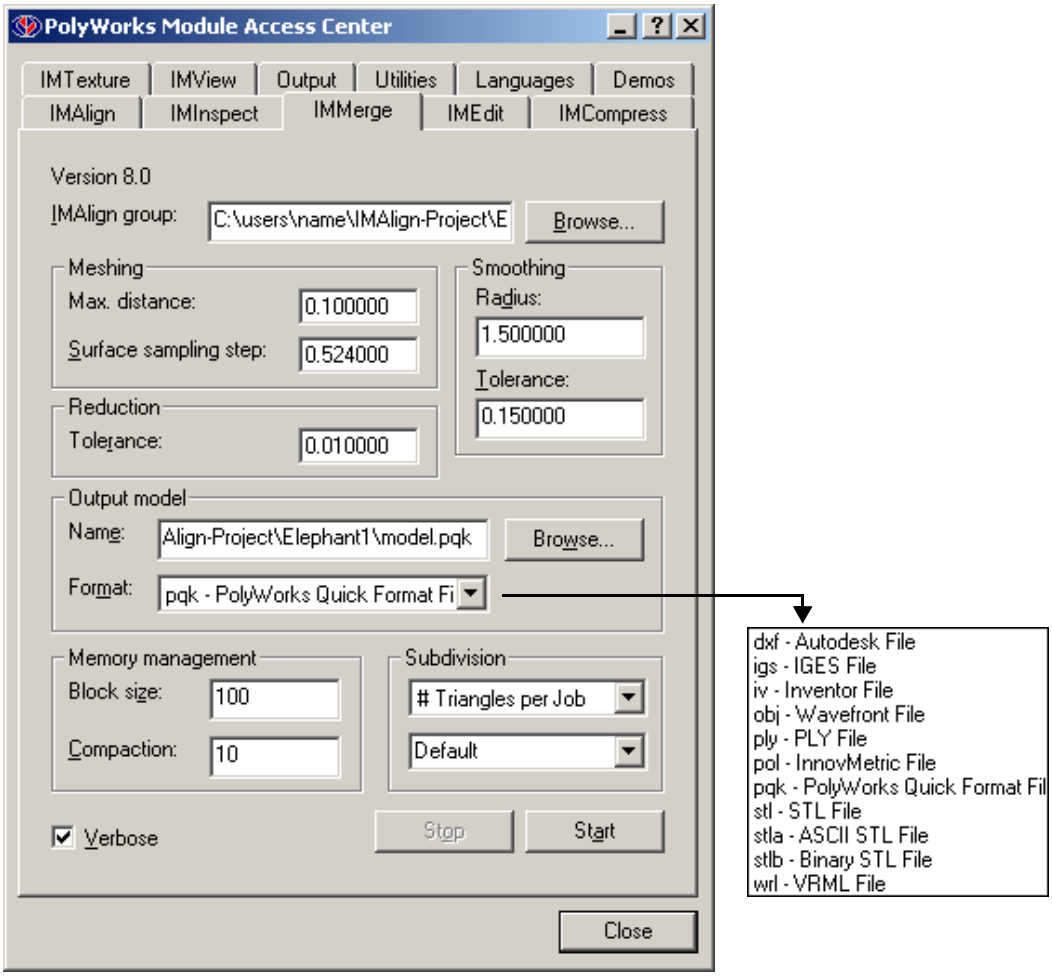

Figure 1.1 The IMMerge tab of the MAC.

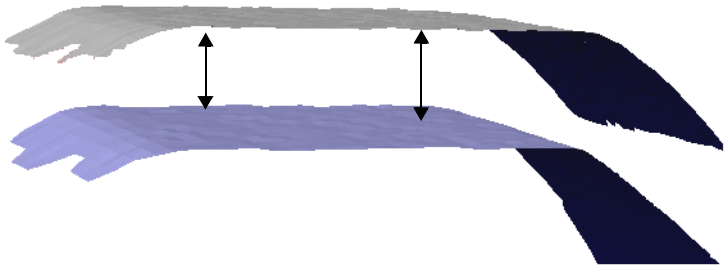

Figure 1.2 Two scans overlap in this illustration. The maximum distance parameter permits the detection and the elimination of the overlap. The resulting surface would be situated somewhere between the two scans.

1.1 Specifying required input parameters

1.1.1 Specifying an IMAlign group directory name

IMMerge computes a high-resolution polygonal mesh from a set of 3D images aligned by IMAlign. Therefore, you must first specify the path to an IMAlign group directory describing a set of aligned 3D images in the **IMAlign group** text box of the IMMerge interface. Note that an adjacent **Browse** button is available for searching the directory structure.

1.1.2 Setting the maximum distance between two overlapping surface areas

In the modeling philosophy of PolyWorks, there must be a minimum amount of overlap between images in a set of 3D images. For instance, IMAlign can only compute alignment parameters for surface areas measured by more than one 3D image. In IMAlign, a **maximum distance** parameter defines an acceptable maximum distance between a 3D image point and another 3D image. The **maximum distance** parameter thus acts as a threshold for detecting overlaps in the set of 3D images.

IMMerge has the same parameter, the **Max. distance** text box of the **Meshing** group box. The **Max. distance** defines a maximum acceptable 3D distance between two overlapping surface areas belonging to two distinct 3D images (see Figure 1.2). The **Max. distance** is used by IMMerge to detect overlaps in the set of 3D images. This detection is essential in order to reconstruct a non-redundant surface representation where each part of the measured object is only described once. It is important to specify a **Max. distance** value that is sufficiently large to detect all actual surface overlaps. **Max. distance** should be set to at least 10 times the standard deviation of the 3D digitizer noise distribution. The **Max. distance** value must be specified in the same units as the 3D images.

Note that when IMMerge is accessed through PolyWorks's MAC interface, the **Max. distance** parameter reads a default value from the same parameter in IMAlign's default configuration file.

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