

# *IMMerge*<sup>™</sup>

Multiple 3D Images Merging Software

Reference Guide Version 8.0 for Windows July 2003

InnovMetric Software Inc. 2014 Jean-Talon Nord, Suite 310 Ste-Foy, Québec, Canada, G1N 4N6 Tel.: (418) 688-2061 Fax: (418) 688-3001

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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**

Report any problems or send your suggestions directly to InnovMetric Software at the address on the front page of this document. The InnovMetric Software technical team can also be contacted by e-mail at support@innovmetric.com.

# 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.

PolyWorks Module Access Center	_ ? ×
IMTexture IMView Output Utilities Languages I IMAlign IMInspect IMMerge IMEdit IMCo	Demos   ompress
Version 8.0 JMAlign group: C:\users\name\IMAlign-Project\E Brow Meshing Max. distance: 0.100000 Surface sampling step: 0.524000 Reduction Tolegance: 0.010000 Output model	ISE
Name:  Align-Project\Elephant1\model.pqk  Browse    Format:  pqk - PolyWorks Quick Format Fire	
Memory management  Subdivision    Block size:  100    Compaction:  10    Image: Stop  Stop    Stop  Stop	art  Autodesk File    igs - IGES File  iv - Inventor File    obj - Wavefront File  obj - Wavefront File    ply - PLY File  pol - InnovMetric File    pqk - PolyWorks Quick Format Fil  stl - STL File    stla - ASCII STL File  stlb - Binary STL File    wrl - VRML File  wrl - VRML File
	Close

Figure 1.1 The IMMerge tab of the MAC.

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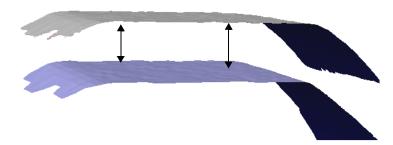


Figure 1.2 Two scans overlap in this illustration. The maximum distance parameter permits the detection and the elimination of the overlap. The resulting surface would be situated somewhere between the two scans.

## **1.1 Specifying required input parameters**

#### 1.1.1 Specifying an IMAlign group directory name

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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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