

# **ShapeGrabber Modeler Training Outline**

**2 Days**



## **Day 1 Morning - ShapeGrabber Hardware**

- Unpacking and Assembling the system
- Powering up the Scanner
- 3D ShapeGrabber Hardware Overview
- Scan Head Principals / Scan Head Specifications
- Motion Platform Specifications

### ***ShapeGrabber Scanner Operation***

- The Scanner Wizard
- Scanner Properties
- ScanView Properties
- Calibration, Calibration Wizard
- Saving the scans / Exporting the scans
- Scan Background

***Hands on time for Trainees to perform all the above tasks.***

## **Day 1 Afternoon - IMAlign**

### ***IMAlign Essentials***

- Using the mouse to rotate and translate 3D images
- Controlling the rendering of 3D images
- Selecting 3D images in the Tree View
- Selecting image data points in the 3D rendering window
- Performing interactive alignment and editing operations
- Saving your configuration

### ***Sequential alignment of a set of 3D images***

#### **General initialization procedure**

- Configure IMAlign for the ShapeGrabber Scanner
  - Use the Image color mode
  - Add an image set to the group
- Delete undesirable data points
- Lock the image set

## **Adding and aligning new image sets**

- Add an image set to the group
  - Manually align the new image set
  - Check the overlap
- Match 1 pair of points
- Match  $N$  pairs of points
  - Align the new image set using the iterative process
  - Lock the alignment of the new image set

## ***Optimizing the global alignment of a set of 3D images***

- Unlock the alignment of all images
- Lock the alignment of one image
- Set the parameters of the image-alignment algorithm
- Save results in the group directory
- Save the results to an XYZ point cloud file
- Hole Editing feature

**Trainees will now complete an Alignment of a set of scans.**

## ***Post-processing***

- Reduce the amount of overlap in the set of 3D images  
(Estimate the IMMerge Step parameter)

## Day 2 IEdit

### ***IMedit essentials***

- Using the mouse to rotate and translate a 3D model
- Controlling the rendering
- Selecting triangles and vertices
- Performing interactive operations
- Working on a part of a model
- Executing a macro
- Saving your configuration

### ***Polygon reduction applications***

- Topology correction
- Using the IMCompress polygon reduction algorithm
- Reducing texture-mapped models using IMCompress
- Extracting the external surface of an assembly
- Deleting small objects in assemblies
- Deleting an offset surface
  - `delete_small_triangles`
  - MACRO EXEC delete\_small\_triangles length**
- Creating batch processes

### ***Milling and RP applications***

- Orienting a polygonal model
- Setting the position of a polygonal model
- Basic triangle-editing operations
- Advanced triangle-editing operations
- Creating and fitting composite Bézier surfaces
- Filling-in holes in a polygonal model
- Inserting a re-digitized area in an existing polygonal model
  - A. Anchoring an initial composite surface
  - B. Subdividing the composite surface
  - C. Reshaping the composite surface
  - D. Attaching model vertices to the composite surface
  - E. Trimming the previous model
  - F. Inserting the new model into the previous one
- Flattening an area
  - A. Fitting a plane
  - B. Selecting vertices
  - C. Projecting selected vertices on the plane
- Verifying the water tightness of a model

**Trainees will now complete a merged model.**