Beholder Desktop

Version 1.0.2

Table of Contents

Beholder Desktop

Welcome to Beholder Desktop, a powerful and user-friendly photogrammetry application designed to make 3D model creation accessible to everyone. Whether you're a professional working in fields like architecture, archaeology, or visual effects, or a hobbyist interested in turning your photos into stunning 3D models, Beholder Desktop offers an intuitive yet robust platform to achieve your goals.

With Beholder Desktop, you can build high-quality 3D models from multiple images of real-world objects. The software automatically processes these images, aligns them, and constructs detailed 3D meshes that are perfect for visualization, 3D printing, virtual reality, or further refinement in other 3D modeling software.

Assuming that your computer meets the system requirements for running Beholder Desktop the recommended next steps are to download and install Beholder Desktop and then run through the introductory tutorial to build a 3D model from a known good photoset to confirm that Beholder Desktop is running correctly on your computer.

System Requirements

Beholder Desktop is a demanding application. To ensure that you get a good experience when using Beholder Desktop please confirm that your PC meets the minimum and, where possible, the recommended system requirements.

Minimum Requirements

- **Operating System** : Windows 10 64-bit
- **Processor** : Intel i5 or equivalent
- **Memory** : 8GB RAM
- **Graphics** : NVIDIA GPU with 4GB VRAM and CUDA compute capability 5.0 or higher
- **Storage** : 16GB available space
- **Internet** : Broadband connection for software activation, updates, and cloud features

Recommended Requirements

- **Operating System** : Windows 10 64-bit or newer
- **Processor** : Intel i7 or equivalent
- **Memory** : 32GB RAM or higher
- **Graphics** : NVIDIA GPU with 8GB VRAM or more and CUDA compute capability 5.0 or higher
- **Storage** : 20GB or more available space
- **Internet** : Fast broadband connection for software activation, updates, and cloud features

NVIDIA Compute Capability

NVIDIA Compute Capability refers to the level of support that an NVIDIA GPU has for different features of the CUDA parallel computing platform. Beholder Desktop requires a compute

capability of at least 5.0, you can find the compute capability for your CUDA GPU at https://developer.nvidia.com/cuda-gpus .

Installation

This chapter describes the steps needed to download Beholder Desktop and then install it on your computer.

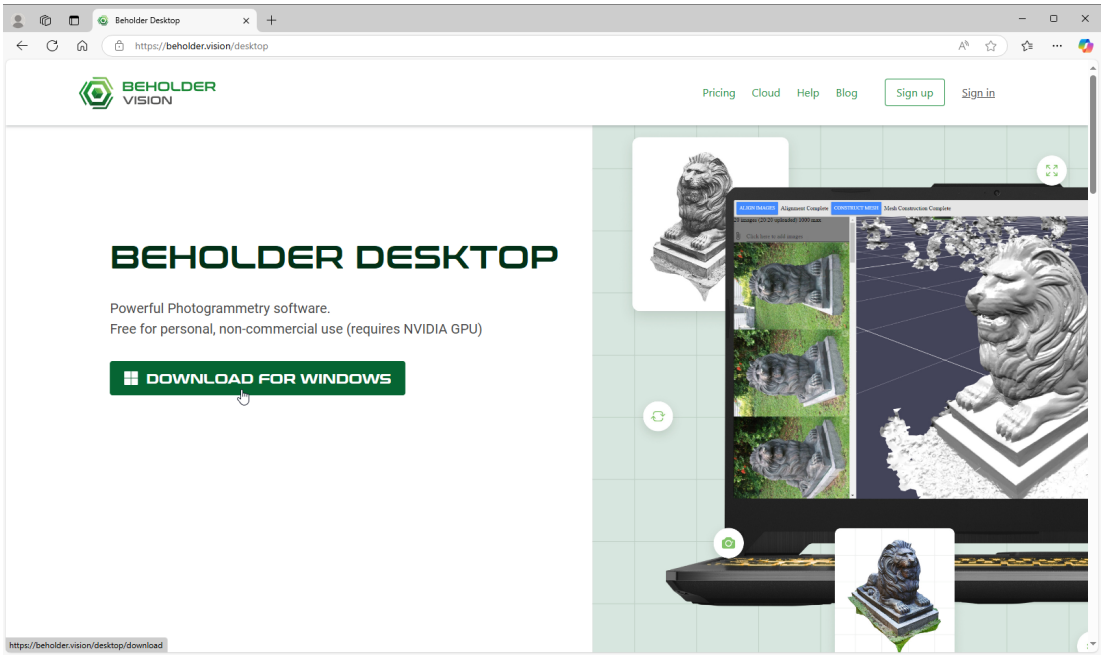
Downloading Beholder Desktop

To begin using Beholder Desktop, you'll first need to download the installer. The application is currently only supported on Windows, and the installation process follows a standard Windows setup procedure.

Follow these steps to get started:

1. Open your web browser and go to the Beholder Desktop website at https://beholder.vision/desktop .

2. Click on the 'Download for Windows' button.



Run the Installer

Once the download is complete, locate the Beholder Desktop installer on your computer, usually found in your Downloads folder.

1. Double-click on the Beholder Setup file to begin the installation process.

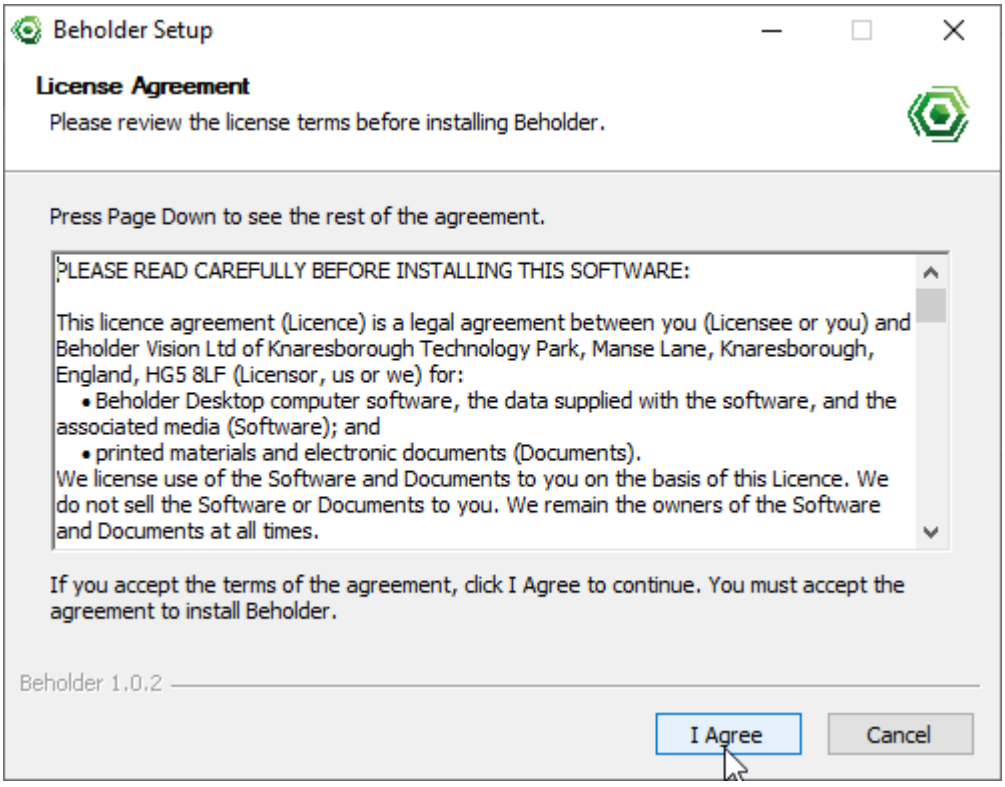
2. Follow the on-screen instructions to install Beholder Vision on your computer.

Accept the License Agreement

During the installation process, you will be prompted to accept the Beholder Vision license agreement.

1. Read the license agreement carefully.

2. Click **I Agree** to continue.



Choose User Installation Options

Choose whether to install Beholder for all users or only for your current user account.

1. Select **All users** if you want the software to be available to anyone who uses the computer.

2. Choose **Only for me** if you want to restrict access to Beholder Vision to your user account only.

3. After making your selection, click **Next** to proceed.

Choose Install Location

Select the destination folder where Beholder Desktop will be installed. You can use the default location or choose a different folder.

1. Click **Browse...** to select a different installation location if desired.

Complete the Installation

After setting your preferences, the installer will be ready to install Beholder.

1. Click **Install** to begin the installation.

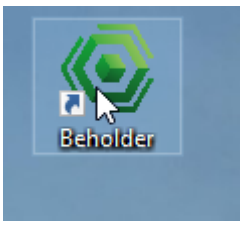
2. Once the installation is complete, click **Finish** to exit the setup wizard.

Launch Beholder Vision

After installation, you can launch Beholder Vision immediately.

1. Look for the Beholder Vision icon on your desktop or in your applications folder.

2. Double-click the icon to open Beholder Vision.



Getting Started

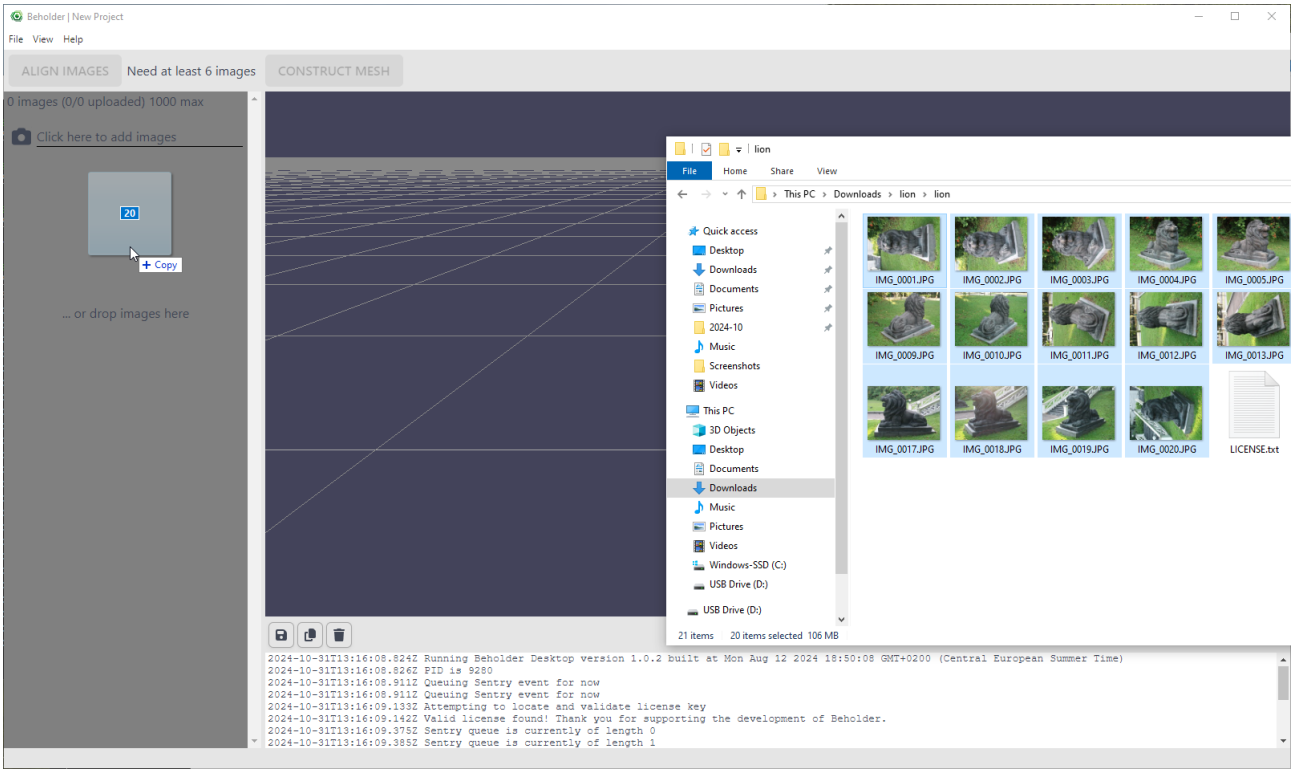
In this chapter we show how to build a 3D model from a small set of photos. It's a good idea to follow these instructions if you're new to Photogrammetry or if you've never used Beholder Desktop before as it allows you to quickly build a 3D model from a known good set of photos and to confirm that Beholder Desktop is working correctly on your computer.

Obtaining Photos to be Aligned

You can obtain a set of photos to use in this tutorial from https://beholder.vision/data/tutorials/getting-started/lion.zip .

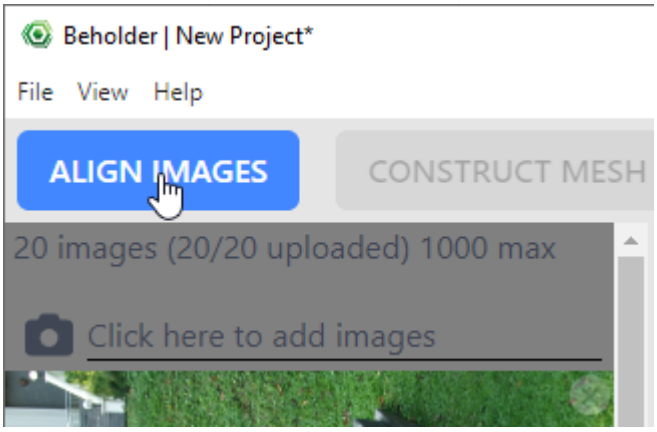
Add Images to the Project

Once you have a set of photos to use you can add the images to the project either by dragging them from your computer onto the image list section on the left, or by clicking in the 'Click here to add images' box.



Start to Align Images

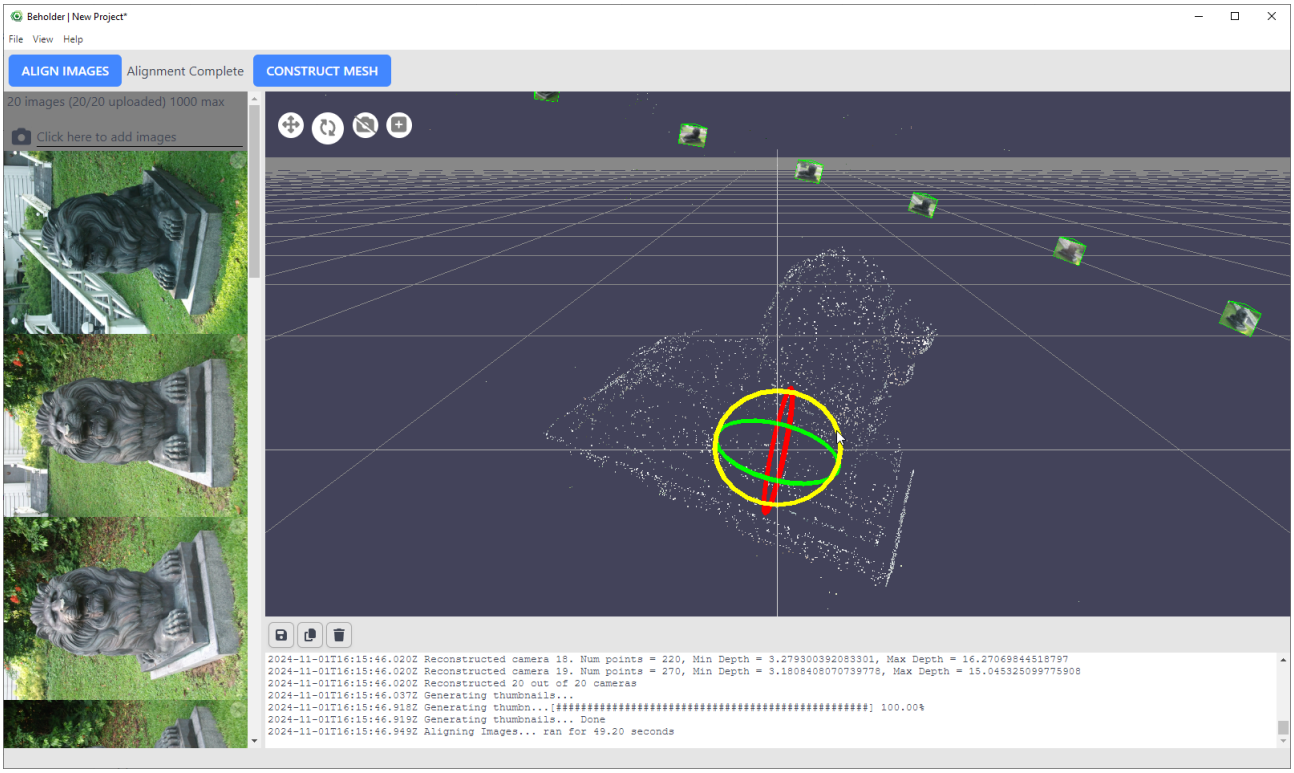
Start the ‘align images’ process by clicking on the align images button. This step will work out the position and orientation that the camera was in for each of the photos that have been added to the project. Once complete you will end up with a point cloud that provides an early preview of the object you’re building.



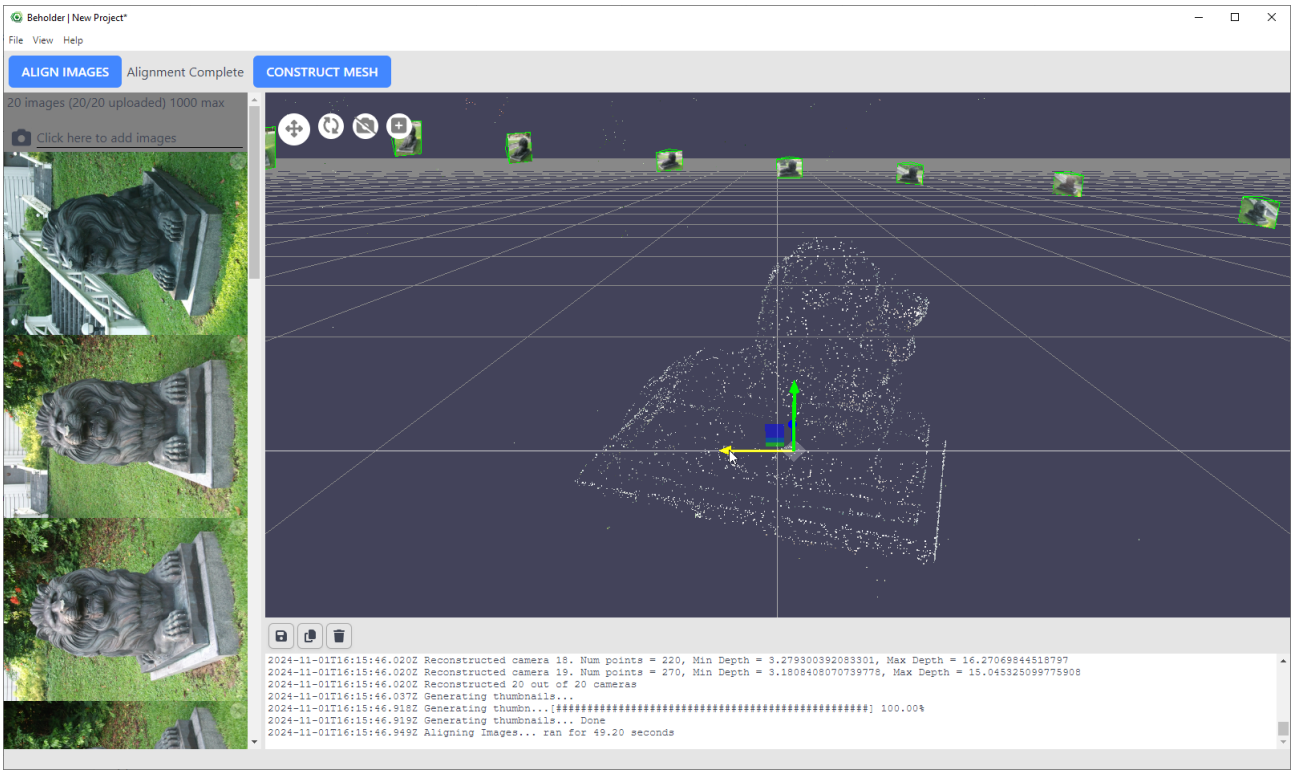
Adjust the Pose of the Point Cloud

After the point cloud has been built, you may find that it is the wrong way up, or posed at an odd angle. You can fix this by using the translation and rotation tools to adjust the pose of the point cloud.

Click on the ‘adjust rotation’ button and then drag the 3D circles to rotate the point cloud.

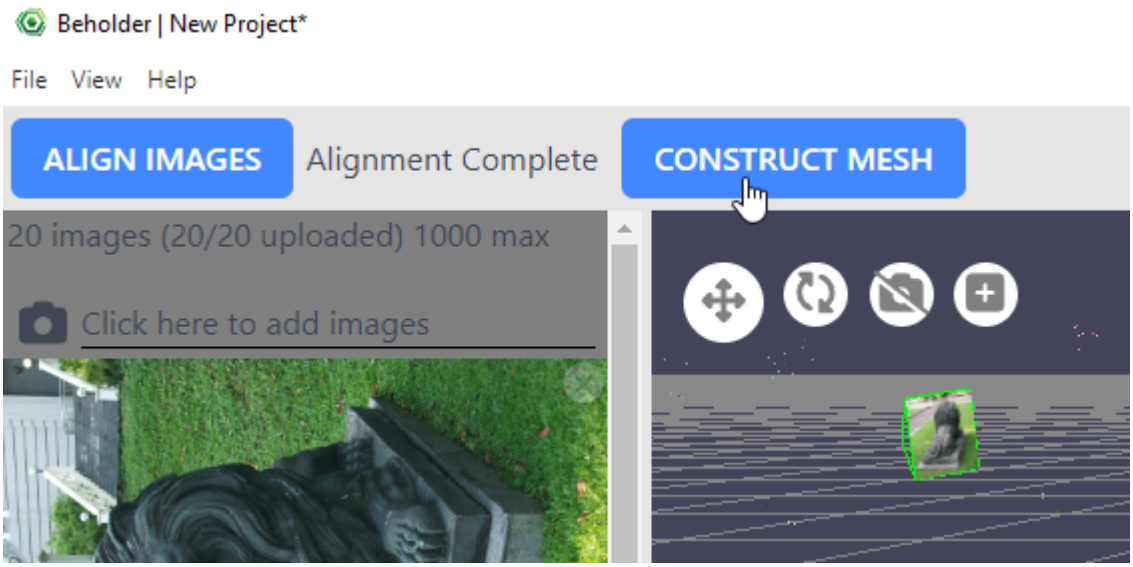


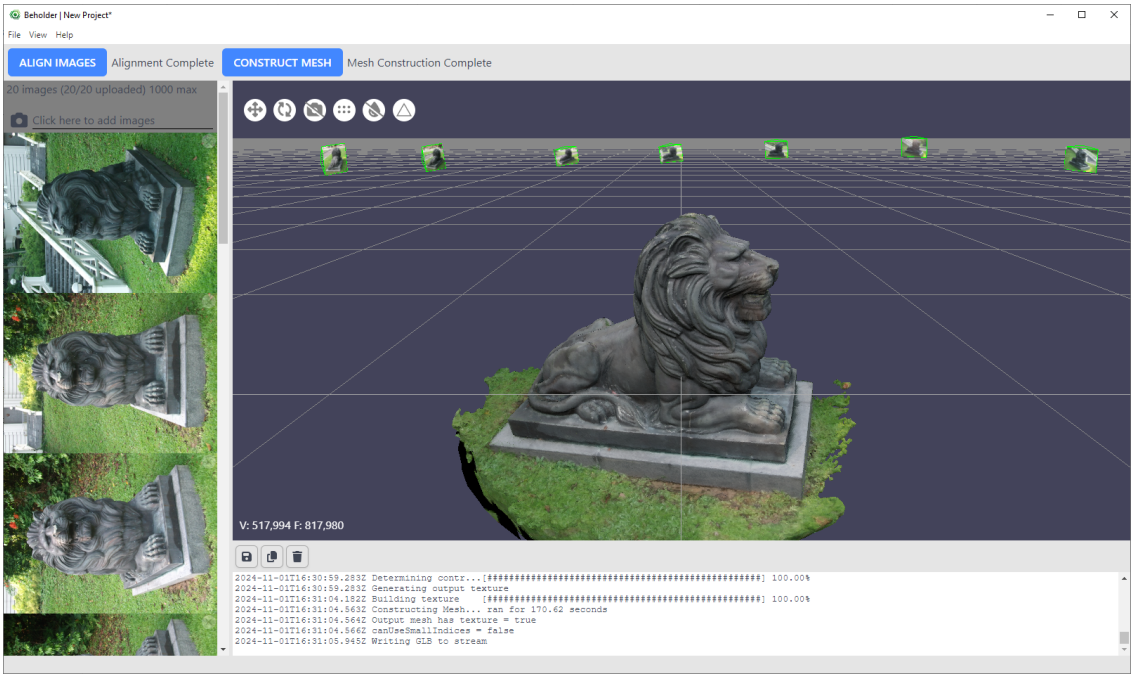
Click on the ‘adjust translation’ button, and then drag the 3D axes to move the point cloud.



Start to Construct the Mesh

Once you’re happy with the initial point cloud built by Beholder, and you’ve adjusted its pose, you can build a 3D mesh by clicking on the construct mesh button.





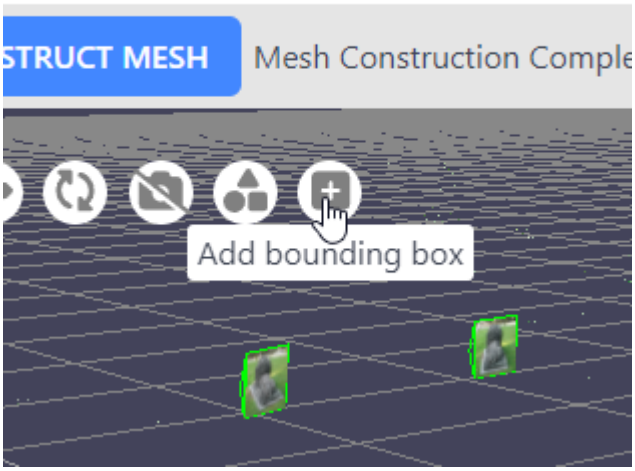
Once the construct mesh process is complete you should see a 3D model like this.

Extra: Focus Reconstruction Area with a Bounding Box

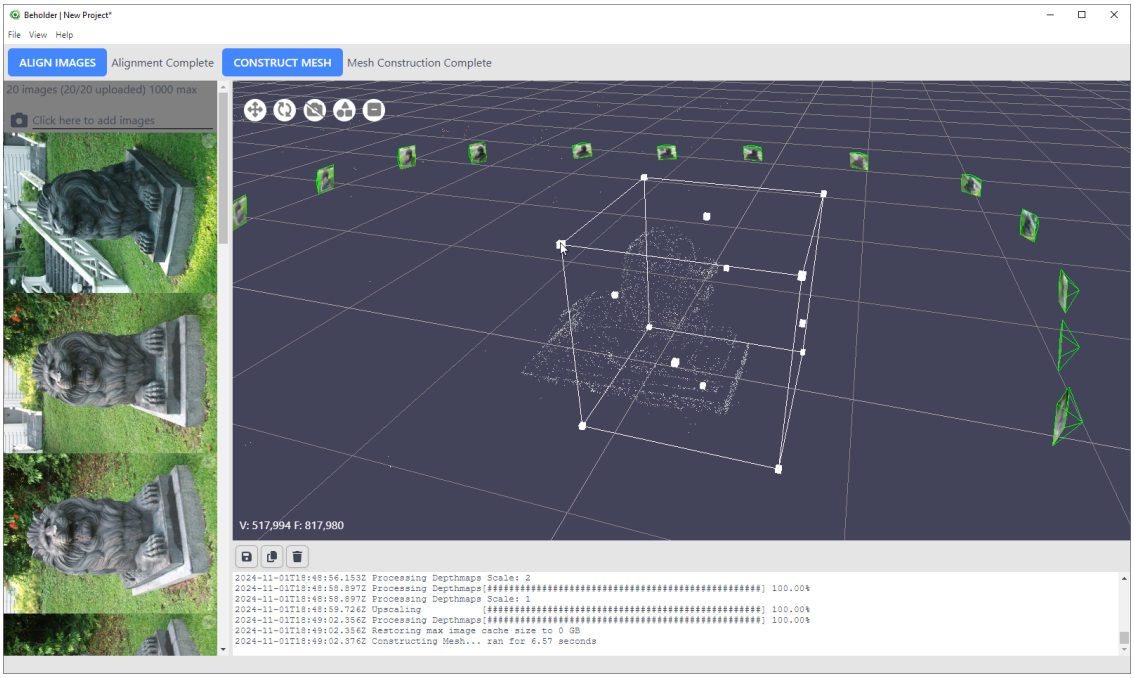
The area to be reconstructed when constructing a mesh will be calculated automatically, but it's also possible to specify the reconstruction area manually. This can be useful if you want to exclude parts of the scene from the final 3D model or if you're only interested in part of the 3D geometry.

To setup the bounding box

switch to point cloud mode



press the button to add in a bounding box



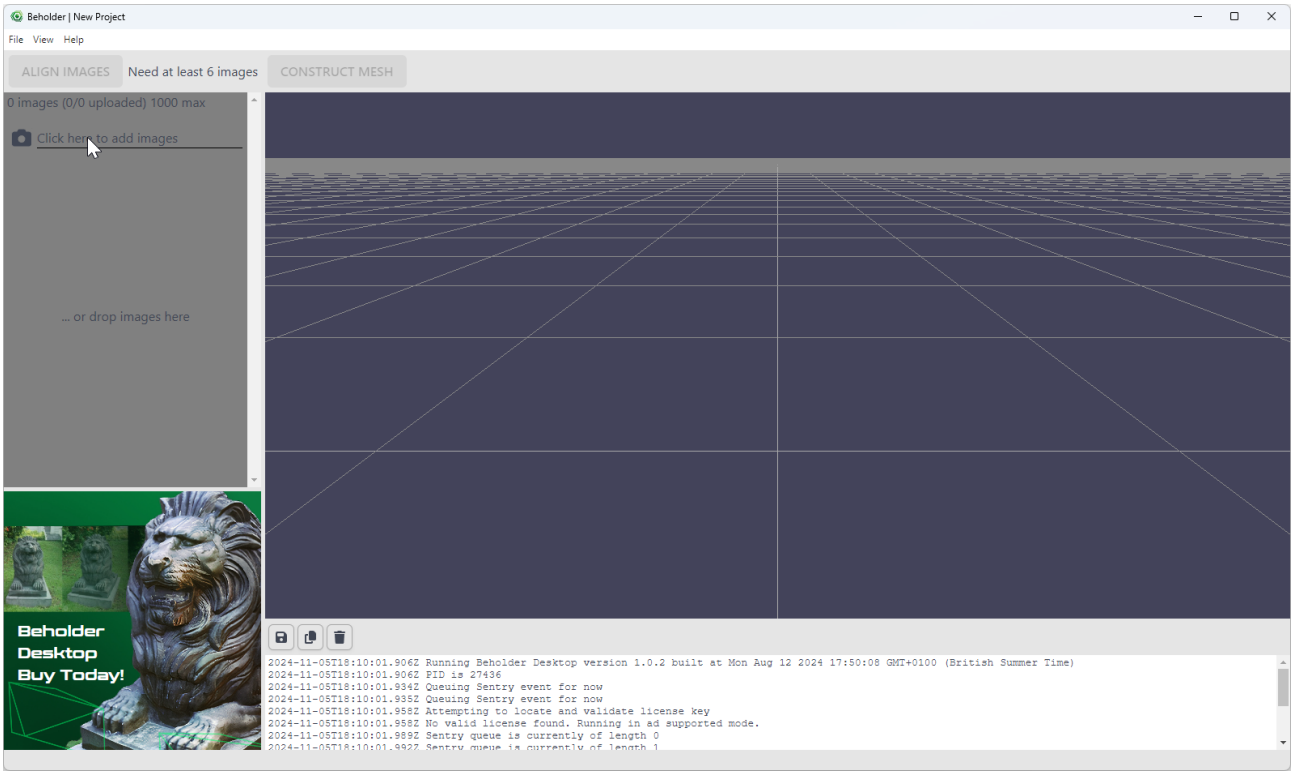
and then use the bounding box control points to specify the position and size of the bounding box.

Next Steps

Once the construct mesh process has finished. You can save the project for later use and you can also export the 3D model for use outside of Beholder Desktop.

User Interface

When opening Beholder Desktop, the interface layout will look like this:



The central part of the interface, the workspace, displays a 3D view where users can manage and interact with objects for photogrammetry. It is the main area where you will spend most of your time aligning images and constructing meshes.

To the left, there's a sidebar that will hold the list of images once uploaded. The software can handle up to a thousand images, allowing for detailed and complex projects.

Below the 3D view, there's a status bar where logs, such as licensing information and operation status, are displayed. This is helpful for tracking the progress of tasks and the state of the software.

At the top, the menu bar presents the main categories: *File* , *View* , and *Help* , providing access to various functionalities of the Beholder software.

The *File* menu in Beholder provides essential project management options:

- **New** : *Ctrl+N* to start a new project.
- **Open...** : *Ctrl+O* to continue work on an existing project.
- **Open Recent** : Access recently opened projects quickly.

- **Save** : *Ctrl+S* for saving the current project.
- **Save As...** : *Ctrl+Shift+S* to save a project under a new name or location.
- **Export Mesh As...** : For exporting 3D mesh models.
- **Preferences** : Toggle the transfer of telemetry and crash data To Beholder as well as automatic update settings.
- **Exit** : Close Beholder, remember to save to avoid data loss.

The *View* menu offers interface customization options:

- **Show Logs** : Toggled on by default, this option displays log information for tracking actions and identifying issues.

The *Help* menu provides assistance and software information:

- **License Key** : Enter or update the software's license for full access to features.
- **About** : Displays the current version and developer details.

Exporting a 3D Model

Beholder Desktop can export the models it creates in a variety of 3D file formats for use in downstream applications such as games, films or for 3D printing to name but a few.

Supported File Formats

The current file formats supported by Beholder Desktop are as follows

- GL Transmission Format Binary (*.glb)
- Wavefront OBJ (*.obj)
- Stereolithography STL (*.stl)

To export a 3D model select File > Export Mesh As..., then in the dialog that pops up, select the file type, select the target directory and enter a name for the exported mesh. Once you're happy click on **Save** to start the export process.

Created using Sphinx 7.4.6.