

How to Use the COLMAP GUI

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Downloading the COLMAP Executable File

- Download the pre-release version available on the COLMAP website.
- Note: To use NVIDIA GPU for dense reconstruction, download the version marked with -cuda.
- For more efficient feature matching, download the vocabulary tree available on the COLMAP website.

Running the COLMAP GUI

- Extract the downloaded file and execute COLMAP.bat to launch the COLMAP GUI.
- Alternatively, run COLMAP.bat gui directly (default command).

SfM/MVS Workflow (Step-by-Step)

1. Create a Project and Load Input Images

- Menu > File > New project
- Set database file location and name (e.g., C:\your_workspace\database.db).
- Select the directory containing images (e.g., C:\your_workspace\images).
- Click Save.

2. Feature Extraction and Matching

- Feature Extraction:
 - Menu > Processing > Feature extraction.
 - If all images share the same camera parameters, enable Shared for all images.

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- If you know the internal camera parameters, select Custom parameters and input values accordingly.

- Feature Matching:

- Menu > Processing > Feature matching.

- Choose from various matching methods (e.g., Exhaustive for all combinations or Sequential for ordered images like SLAM datasets).

3. Sparse Reconstruction (SfM):

- Menu > Reconstruction > Start reconstruction.

4. Dense/Mesh Reconstruction:

- Menu > Reconstruction > Dense reconstruction.

- For Mesh Reconstruction, perform dense reconstruction first and follow up with Poisson reconstruction.

Saving Results

- Save the project: Menu > Project > Save project.

- Save sparse reconstruction results:

- Menu > File > Export all models.

- Results are saved in images.bin, cameras.bin, and points3D.bin within a folder.

Loading Results

- Load a project: Menu > Project > Open project.

- Load sparse reconstruction: Menu > Import model.

- Load dense reconstruction: Menu > Import model from workspace (fused.ply file).

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One-Step SfM/MVS Workflow

1. Automatic Reconstruction:

- Menu > Reconstruction > Automatic reconstruction.
- Set the workspace and image folders.
- Enable Shared intrinsic if images share the same camera parameters.
- Run the process.