Material AI Manual v1.0.0

Introduction

Material AI : Generating Materials from Text to Images and Images to Materials
Material AI is dedicated to providing creators with a seamless material generation experience, leveraging the powerful ComfyUI and ControlNet technologies to effortlessly produce high-quality textures.

Key Features

Real-Time Preview and Control: Preview and adjust textures directly within Blender.

PBR Map Creation: Generate a set of PBR maps, including albedo, height, diffuse, and roughness, to create photorealistic materials.

LH Asset Library Management: Effortlessly save, delete, and preview materials within the LH Asset Library from any Blender file, streamlining material management and reuse.

Features Overview

ComfyUI ControlNet integration

Effortlessly connect with ComfyUI through Material AI's setup panel, allowing you to start, test, and stop ComfyUI directly within Blender for a streamlined workflow, while also enabling precise control over outputs by previewing reference images directly within the panel.

Friendly Operation

Designed with simplicity in mind, Material AI requires no specialized skills, making it easy for beginners to create materials.

Flexible Model Management

In addition to offering recommended models for download with automatic path configuration, you can also manage models manually. By correctly setting the model paths, you have the flexibility to update or replace models as needed, ensuring they align perfectly with your project requirements.

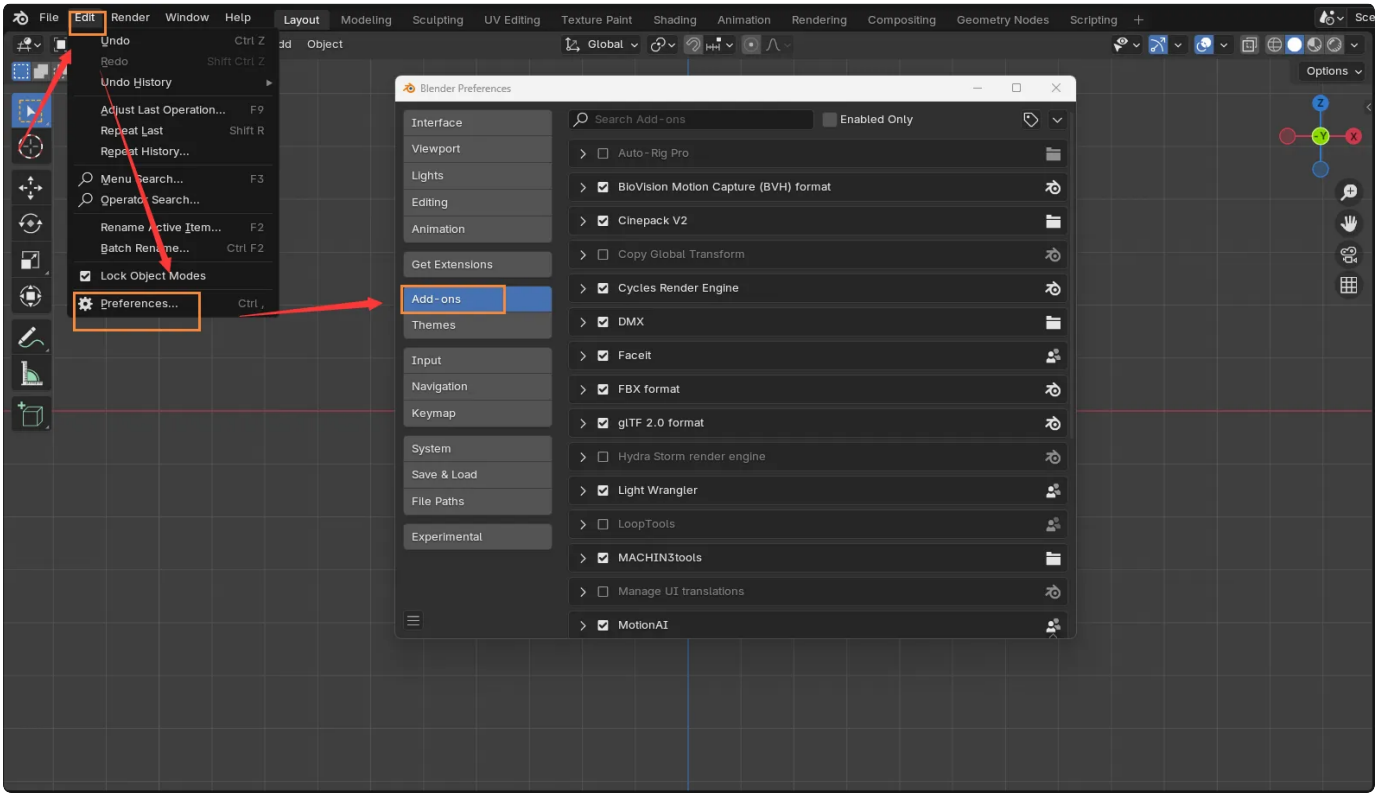
Installation

Download the Plugin

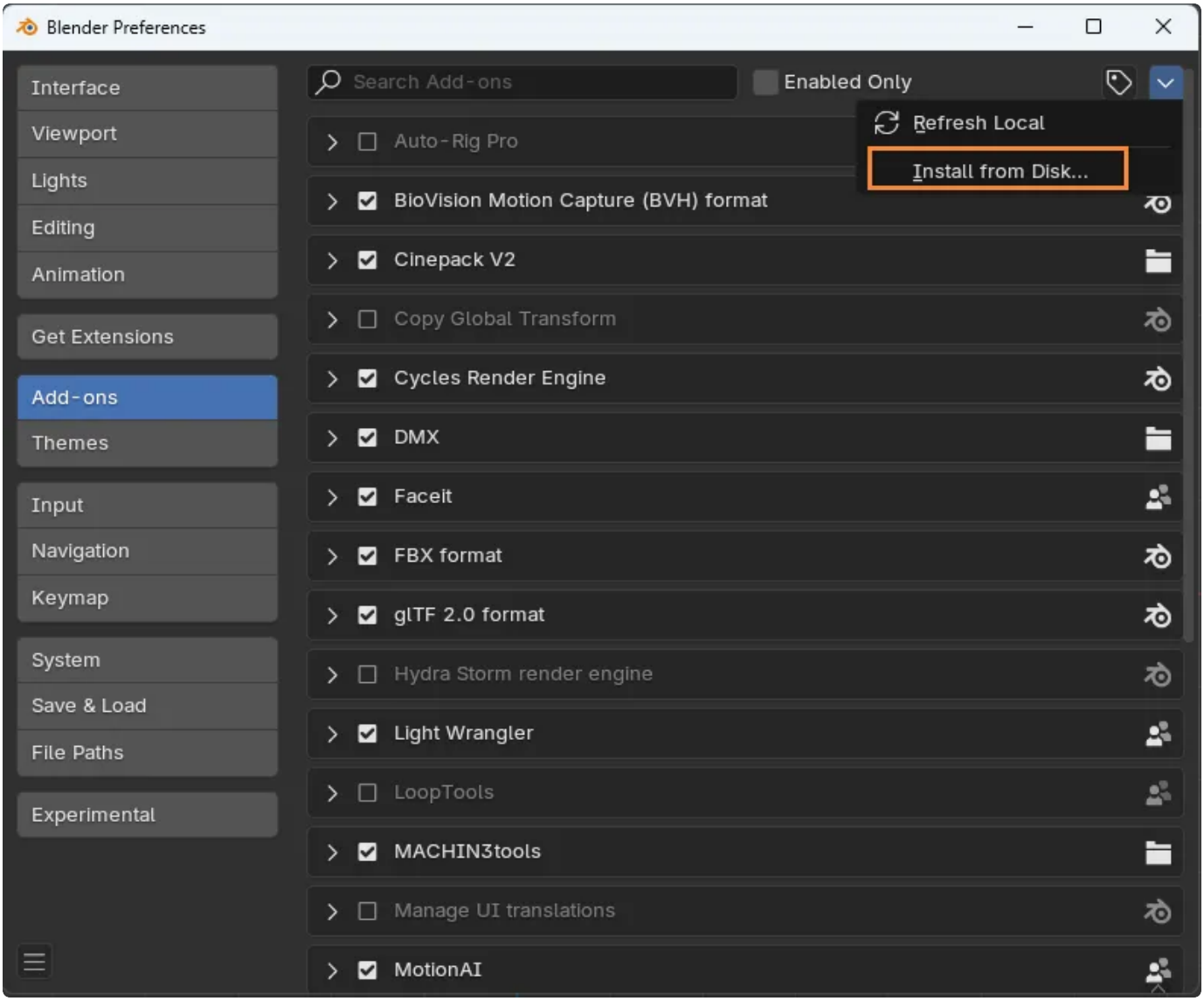
Obtain the Material AI from the Blender Market.

Install Material AI

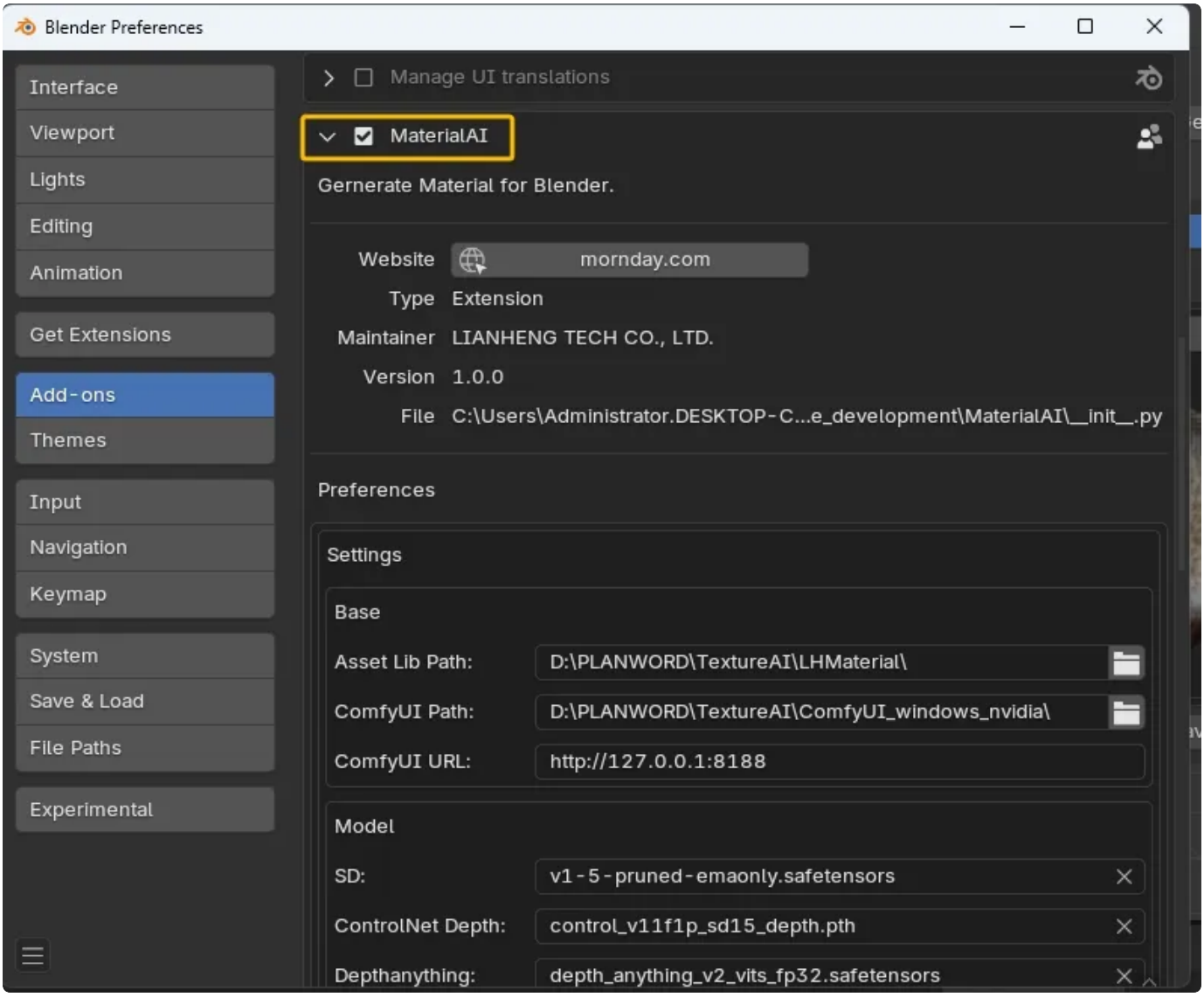
1. Unzip ComfyUI_windows_nvidia_LH.zip.
2. Open Blender –> Edit > Preferences > Add–ons.



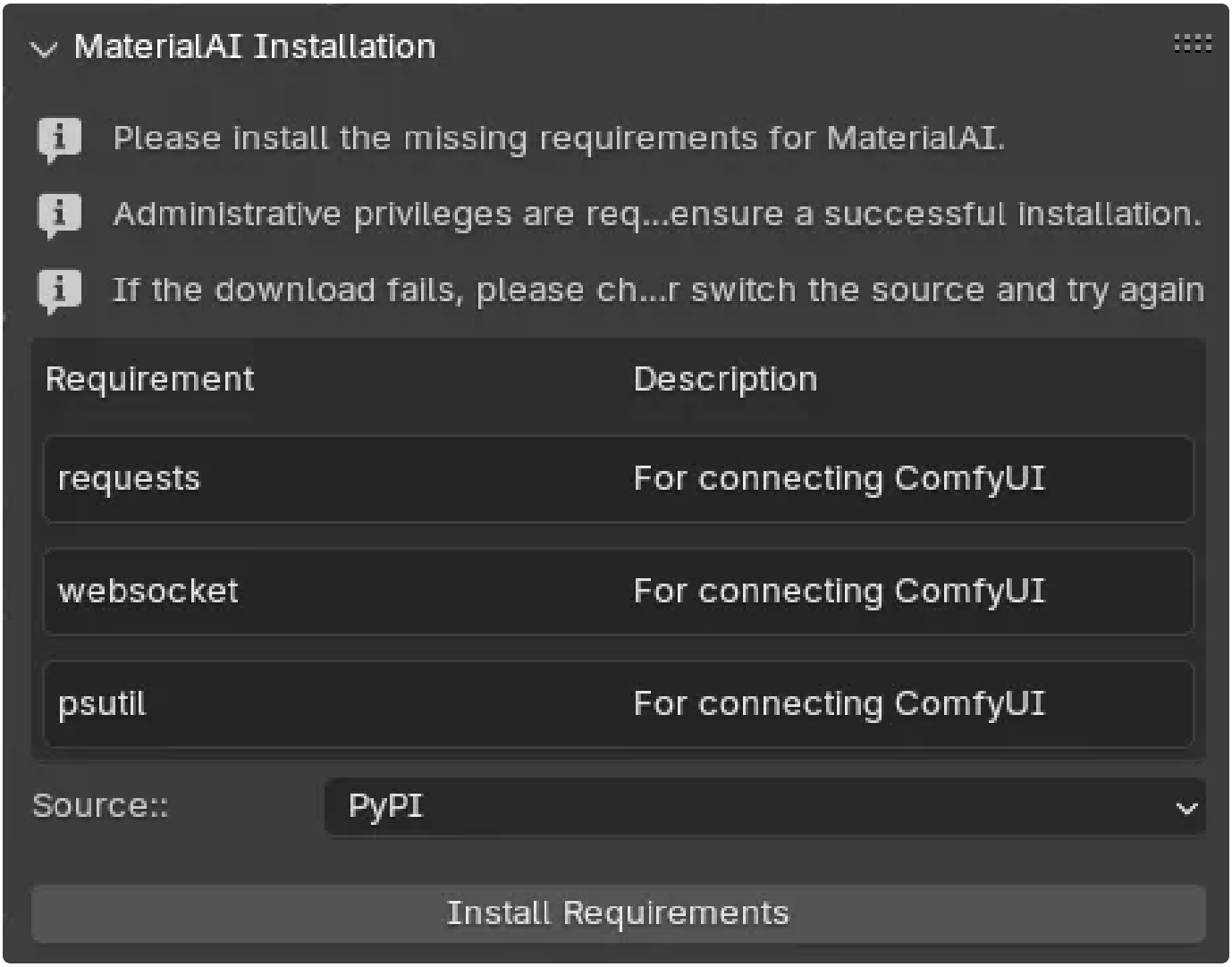
3. Install from Disk –> Select the MaterialAI.zip file.



4. Enable the Add-on.

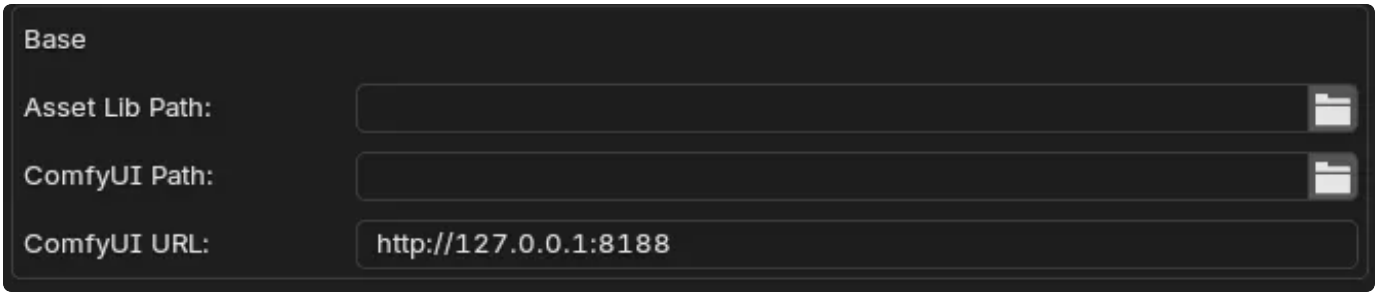


5. Open the Material AI Panel and Install Dependencies
   5.1. Press N on your keyboard or click the small arrow on the right side of the Blender interface to open the sidebar.
   5.2. In the sidebar, find and select the Material AI panel.
   5.3. Material AI will perform an environment check to ensure the dependency is set up correctly. If any required modules are missing, you will see an option to Install them. Click on this to automatically download and install the necessary requirements.



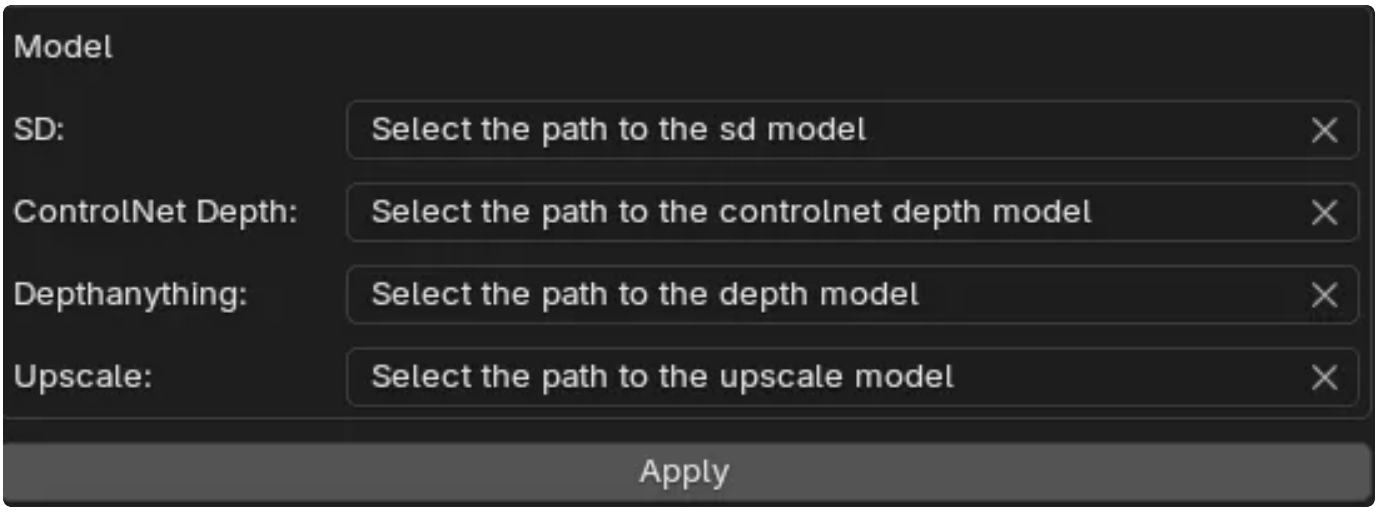
Set ComfyUI Settings

1. Open Blender –> Edit > Preferences > Add-ons.
2. Find Material AI and configure ComfyUI as needed.
   2.1. Base Settings
   - Asset Lib Path: Set the path to your asset library folder.
   - ComfyUI Path: Set the path to your ComfyUI folder.
   - ComfyUI URL: Set the ComfyUI startup URL, for example: `http://127.0.0.1:8188`.



2.2. Model Settings:

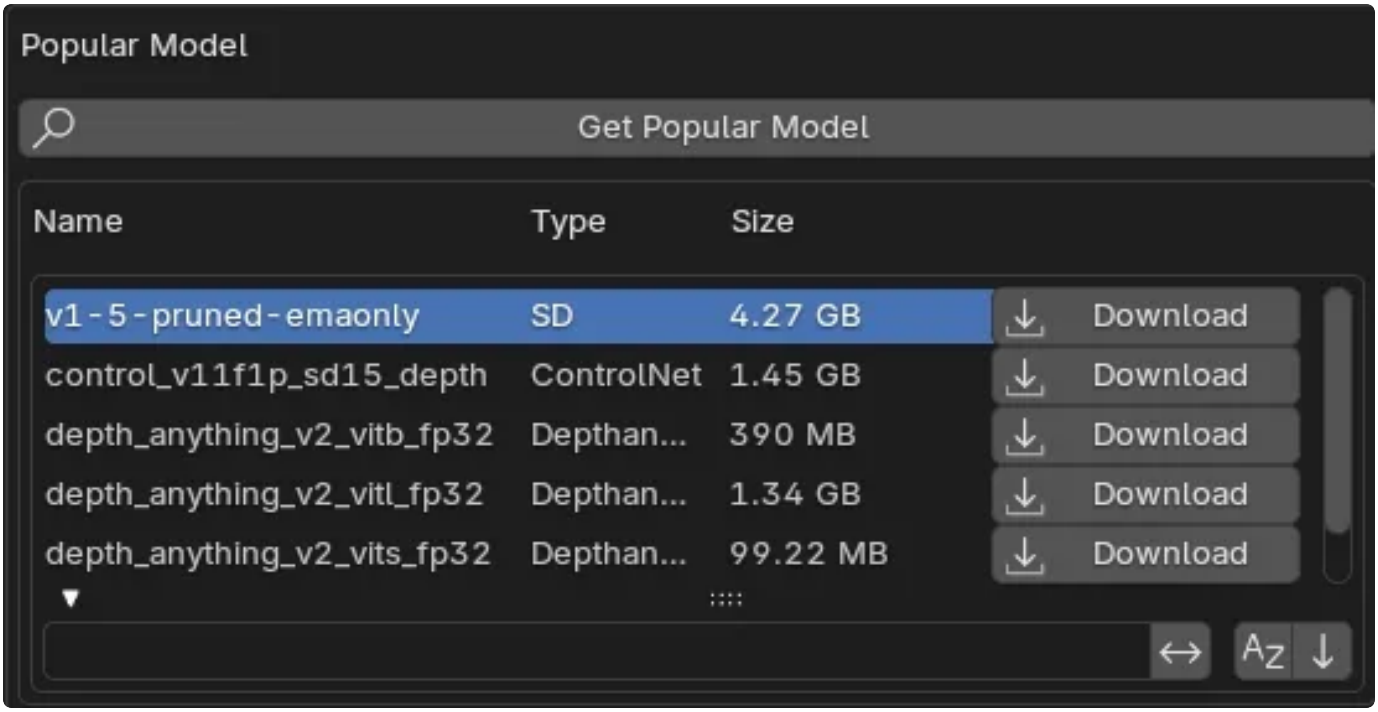
- SD: Select the SD model.
- ControlNet Depth: Select the ControlNet Depth model.
- Depthanything: Select the Depthanything model.
- Upscale: Select the Upscale model.



3. Click "Apply" bottom.
4. Model Download

4.1. Recommended Model Download

- Click "Get Popular Model" bottom.
- Find the model you need.
- Click "Download" bottom.



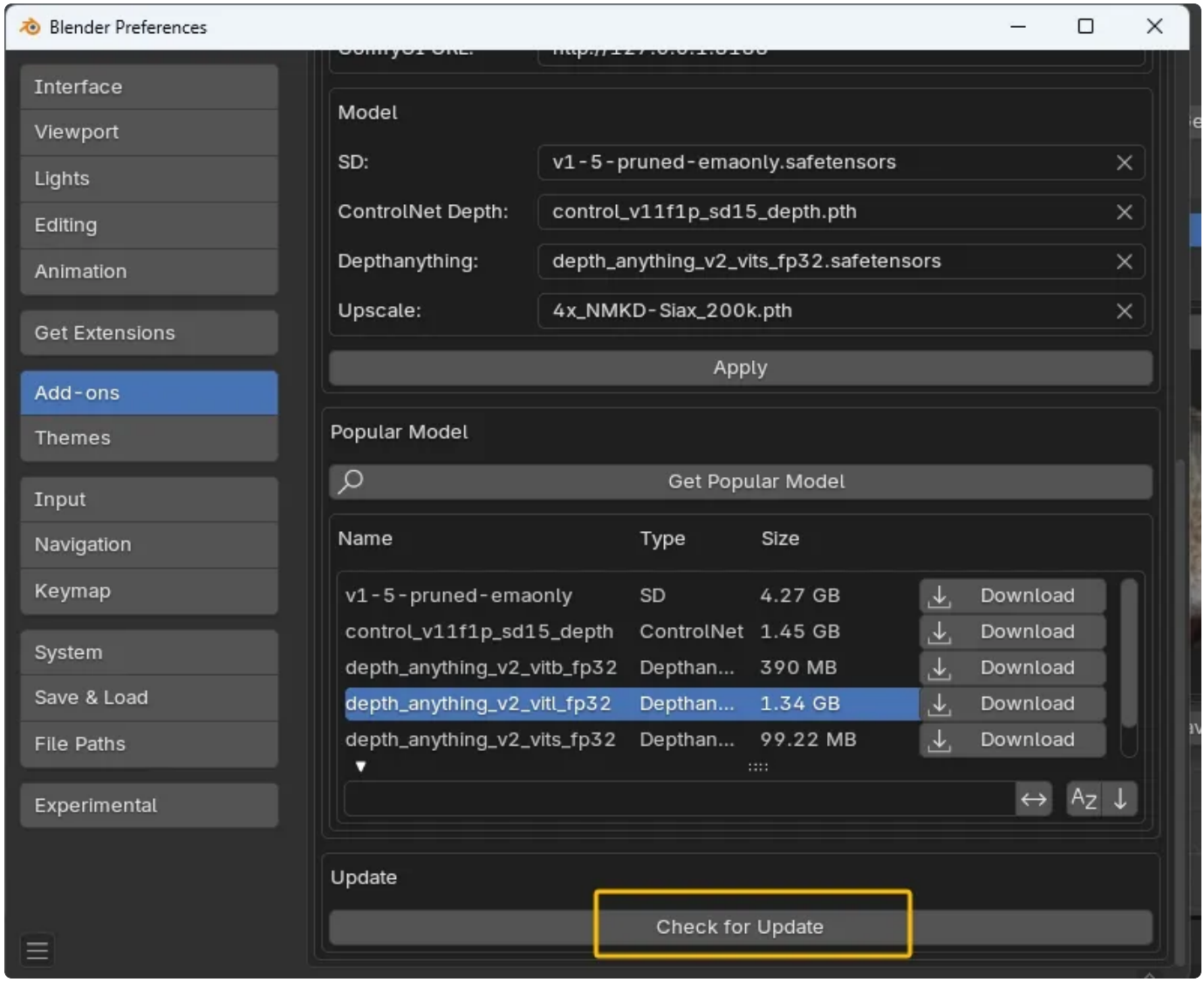
4.2. Custom Model Path Setting:To configure your custom models, ensure that the files are placed in the appropriate folders within your ComfyUI directory. Replace `Your Comfy UI Path` with the actual path where you installed ComfyUI. The full paths should look like this:

Model Name	File Path
SD	[**Your ComfyUI Path**]/models/checkpoints/
ControlNet Depth	[**Your ComfyUI Path**]/models/controlnet/
DepthAnything	[**Your ComfyUI Path**]/models/depthanything/
Upscale	[**Your ComfyUI Path**]/models/upscale_models/

4.3. Tips： The plugin currently supports the use of **SDXL** and **SD1.5** models only.

Update Material AI

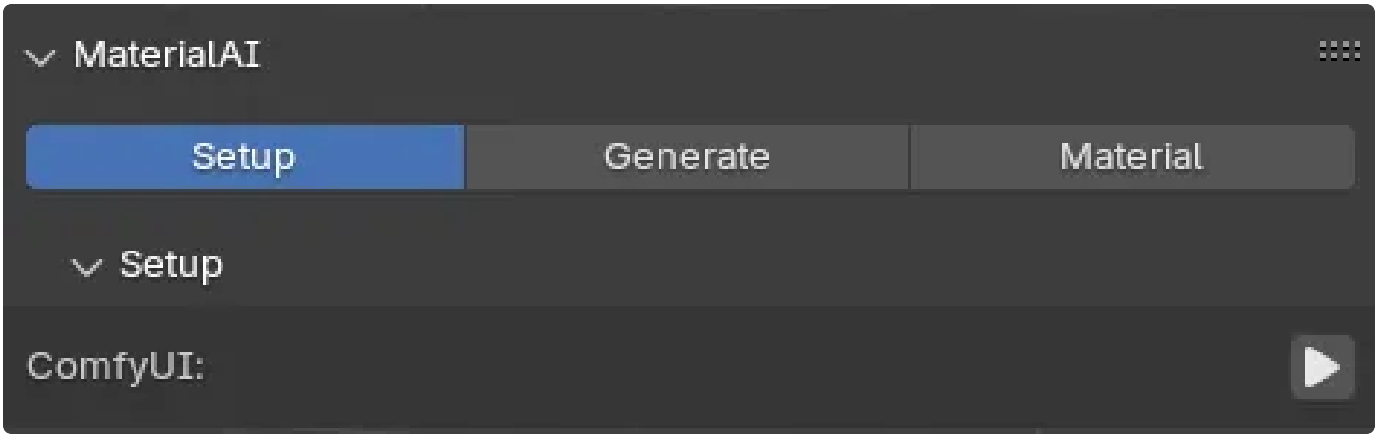
1. Open Blender –> Edit > Preferences > Add-ons.
2. Find Material AI –> Check for Update.



Quick Start – New Material

Setup

1. **"Start ComfyUI"** button: Click the **"Start ComfyUI"** button to launch ComfyUI.

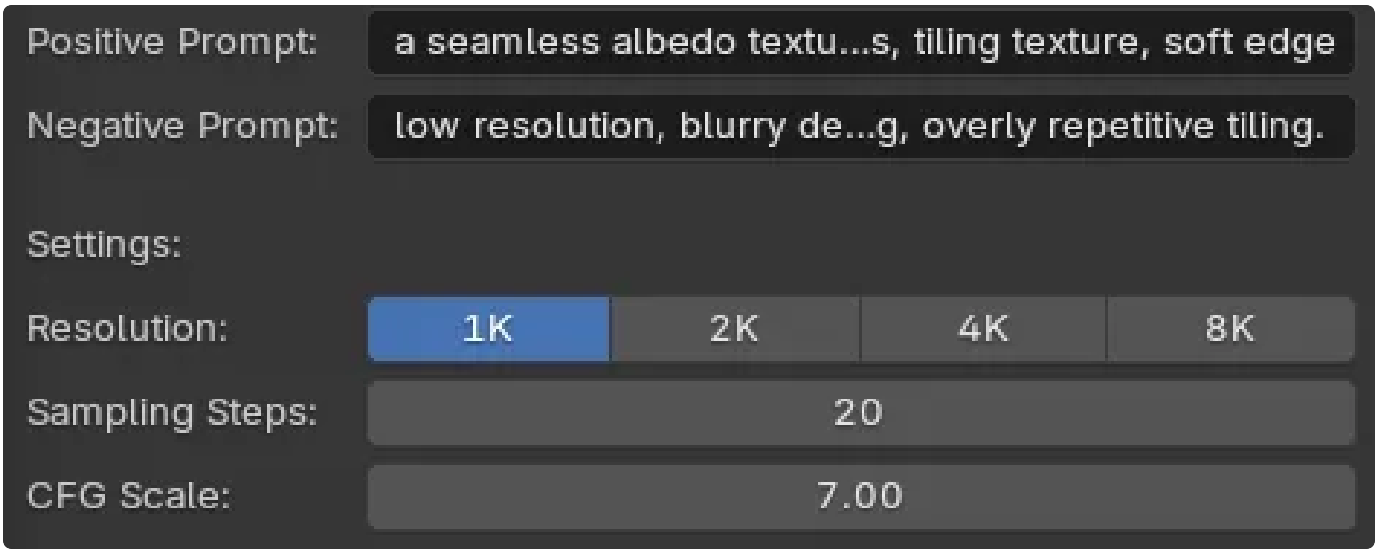


Generate

1. Resolution: Choose the image resolution
2. Prompt
    - **Prompt**

      Enter descriptive text for the image you want to generate.
    - **Negative Prompt**

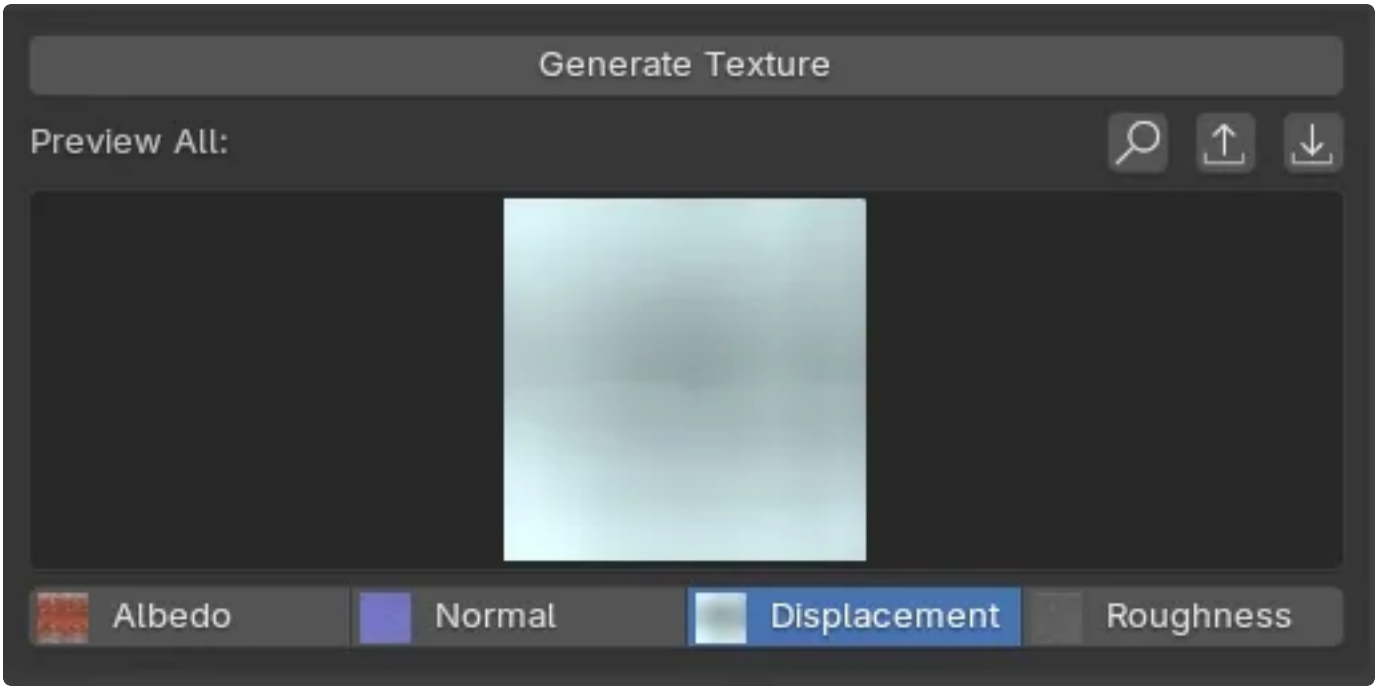
      Specify elements you want to avoid in the generated image.
3. Settings
    - Resolution: Choose the image resolution
    - Sampling Steps: Define the number of steps for refining the image. Higher values result in better quality but increase generation time.
    - CFG Scale: Adjust the strength of the prompt's influence.



4. Use ControlNet
    - Enable **"Use ControlNet"** and input the path to the ControlNet reference image. This

image is in color.

5. Click **"Generate Albide"** botton and choose your preferred albedo map.
6. Click **"Generate Texture"** botton
    - You can click the **Download** button to save the current image for adjustments.
    - After making your changes, click the **Upload** button to upload the modified image.

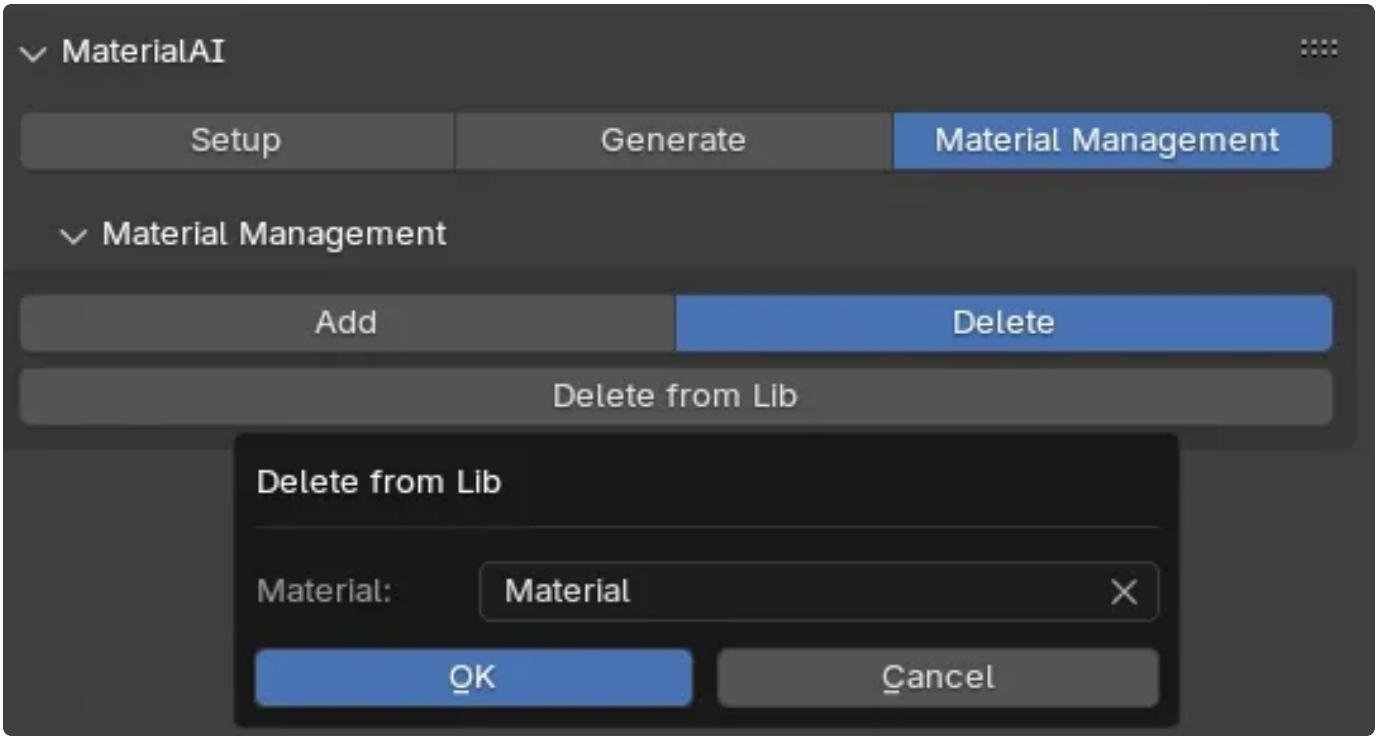


7. Click **"Create Material"** button
    - Choose how to apply the material by displaying it on a plane, sphere, or cube.
    - Enter material name.
8. Shader Edit
    - Open the **Shader Editor** and adjust the following parameters.
    - **Roughness**: Controls the smoothness and reflectivity of the material's surface.
        - Scale: Default value 1.0
        - Offset: Default value 0.0
        - Randomness: Default value 0.0
    - **Normal**: Defines surface details like bumps and reflection direction through normal maps.
        - Strength: Default value 1.0
        - Scale X: Default value 1.0
        - Scale Y: Default value 1.0
        - Scale Z: Default value 1.0
    - **Displacement**: Used to change the geometry of the model surface and add a realistic height difference effect.
        - Midlevel: Default value 0.5
        - Scale: Default value 0.03
        - Flip: Default value 0.0

Material Management

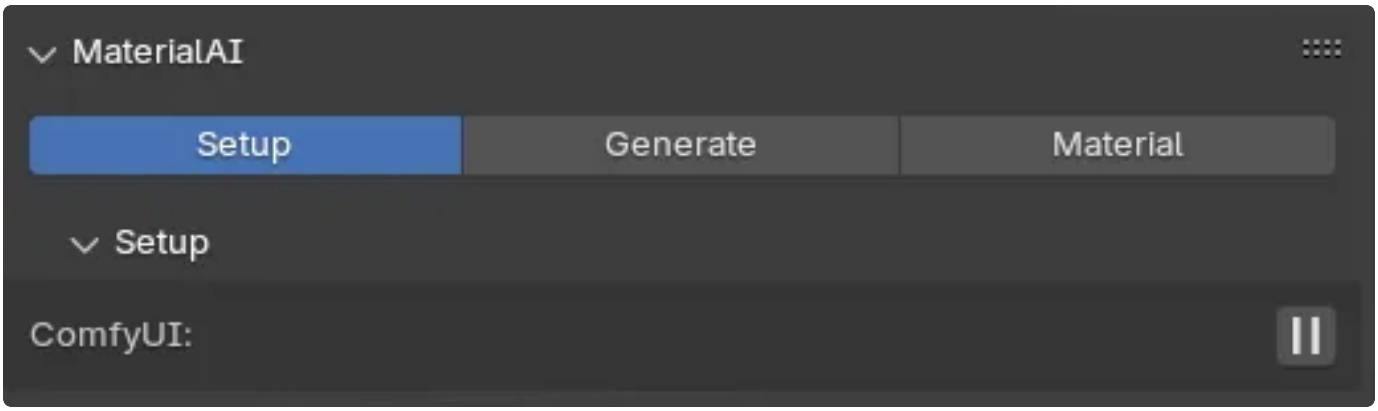
1. Add Material
    - Preview Render Type
        i. Adjust the size of the preview area by dragging the **Preview Scale** slider at the top of the preview window.
        ii. Select the preview render type on the right side of the preview area.
    - Click "Save to Lib" to save the material to the LH asset library.

2. Delete Material
    - Click "Delete from Lib" button. In the pop-up window, select the name of the asset you want to delete and confirm by clicking **"OK"**.



Setup

1. **"Stop ComfyUI"** button: Click the **"Stop ComfyUI"** button to stop ComfyUI.



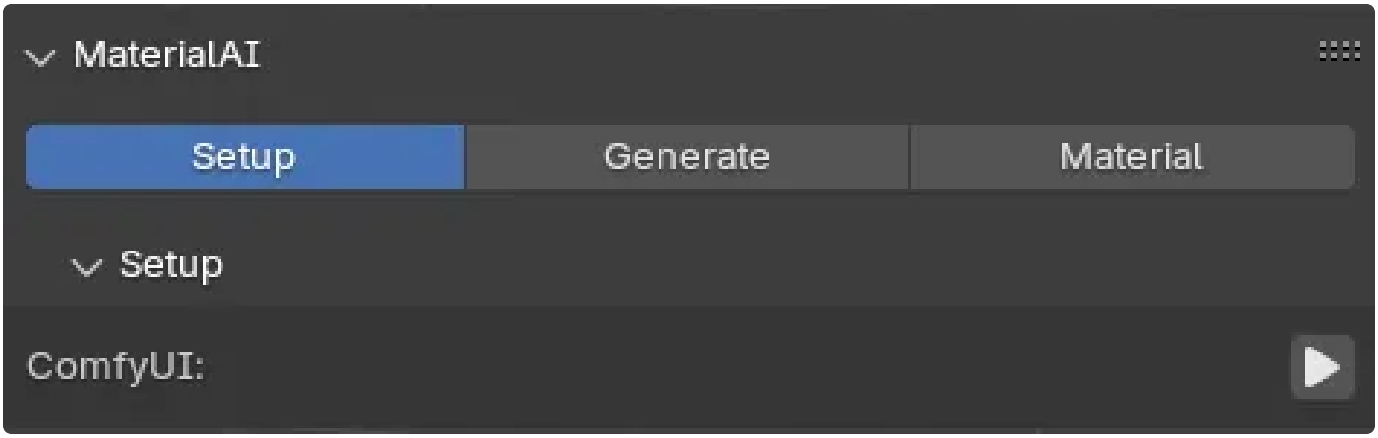
Quick Start – Local Albedo

WorkFlow： **LH Material**

To start using Material AI, follow the steps below:

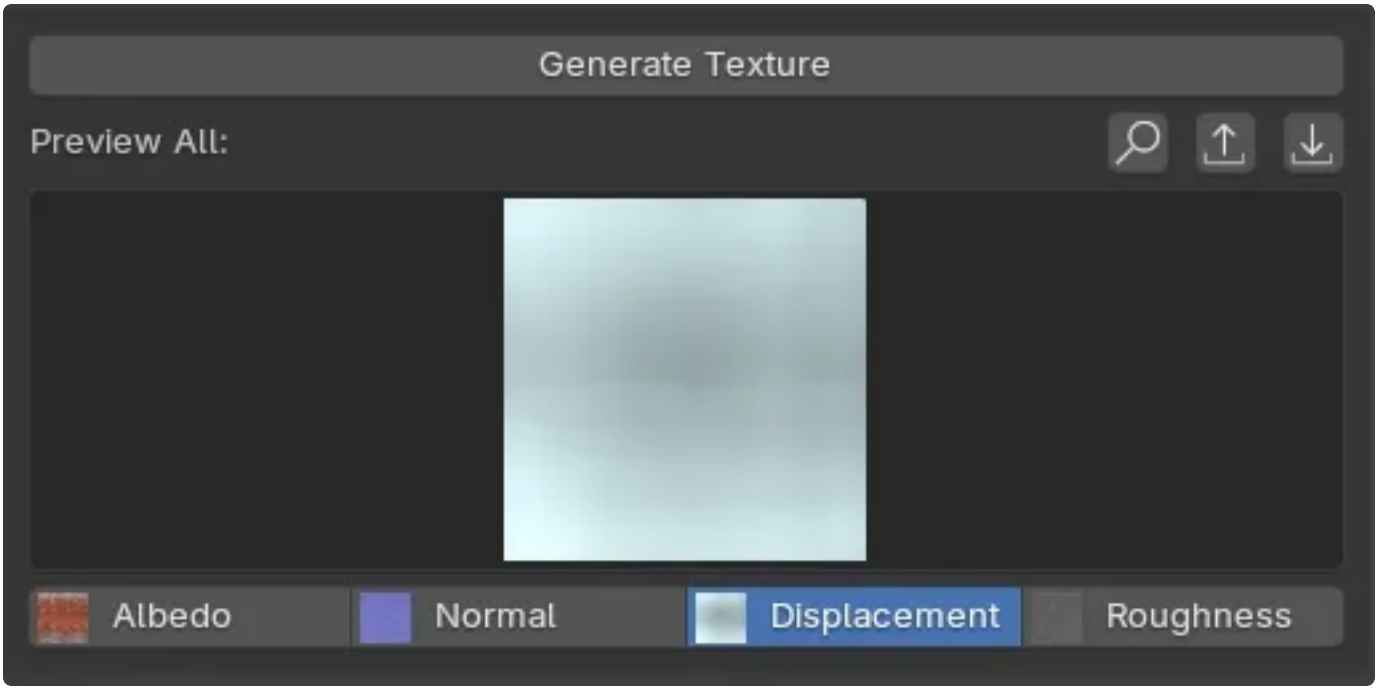
Setup

1. **"Start ComfyUI"** button: Click the **"Start ComfyUI"** button to launch ComfyUI.



Generate

1. Choose the image resolution.
2. Select your albedo path.
3. Click **"Generate Texture"** botton
    - You can click the **Download** button to save the current image for adjustments.
    - After making your changes, click the **Upload** button to upload the modified image.



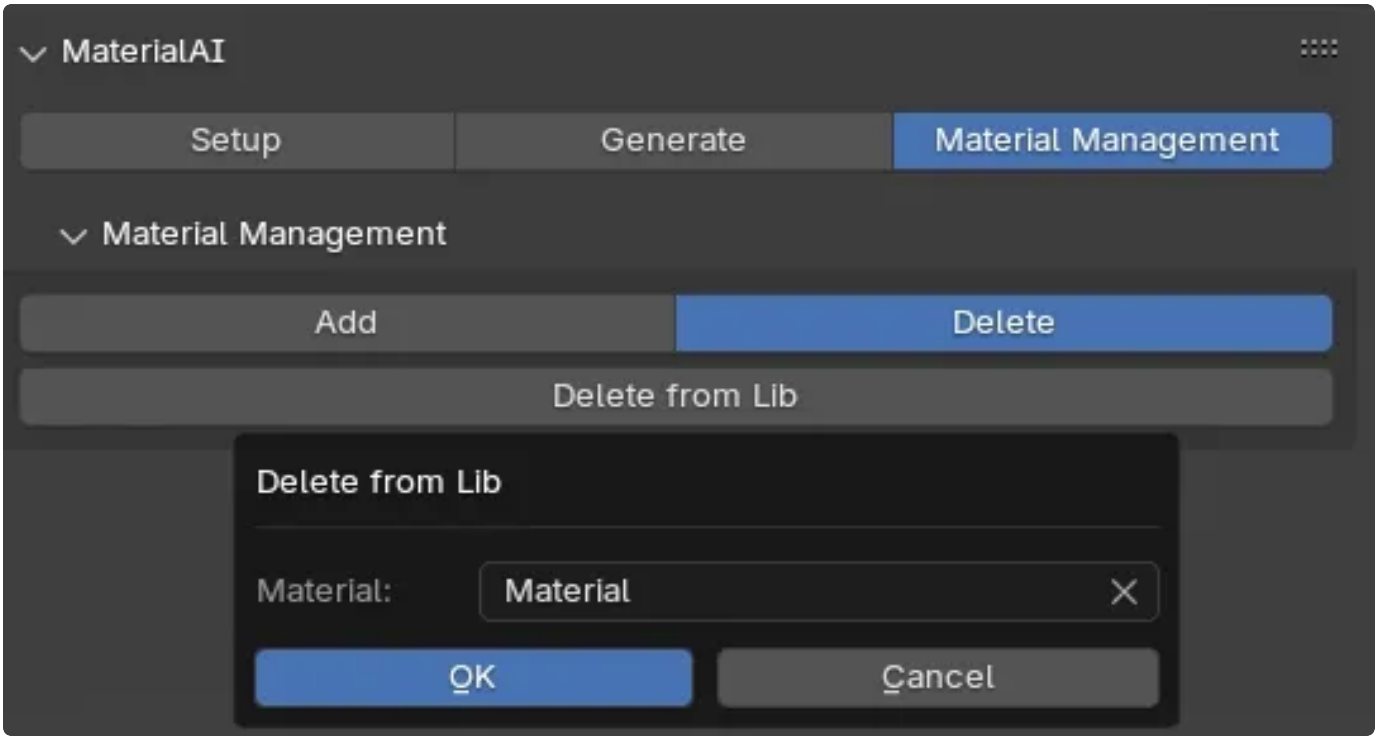
4. Click **"Create Material"** button
    - Choose how to apply the material by displaying it on a plane, sphere, or cube.
    - Enter material name.
5. Shader Edit
    - Open the **Shader Editor** and adjust the following parameters.

- **Roughness**: Controls the smoothness and reflectivity of the material's surface.
  - Scale: Default value 1.0
  - Offset: Default value 0.0
  - Randomness: Default value 0.0
- **Normal**: Defines surface details like bumps and reflection direction through normal maps.
  - Strength: Default value 1.0
  - Scale X: Default value 1.0
  - Scale Y: Default value 1.0
  - Scale Z: Default value 1.0
- **Displacement**: Used to change the geometry of the model surface and add a realistic height difference effect.
  - Midlevel: Default value 0.5
  - Scale: Default value 0.03
  - Flip: Default value 0.0

Material Management

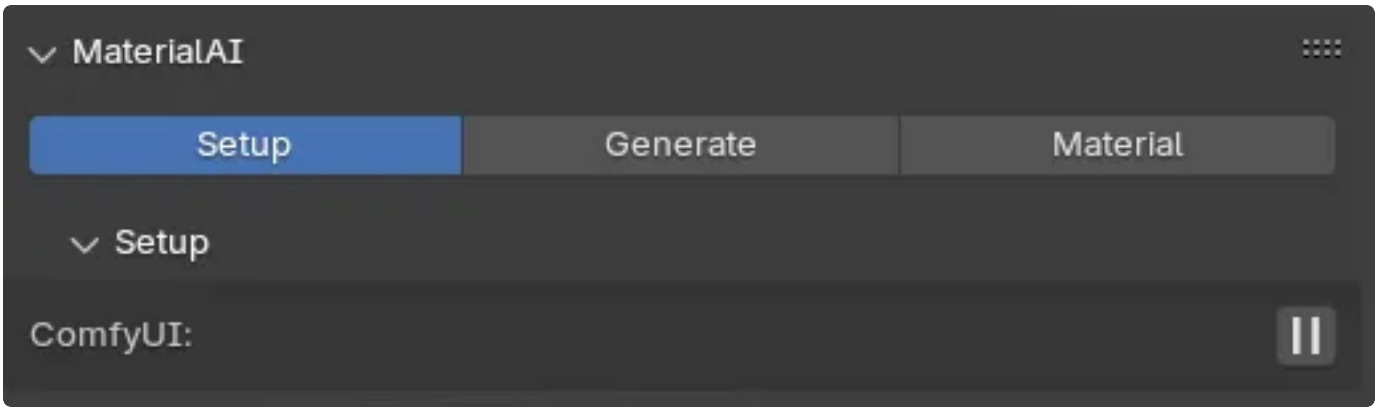
1. Add Material
   - Preview Render Type
     i. Adjust the size of the preview area by dragging the **Preview Scale** slider at the top of the preview window.
     ii. Select the preview render type on the right side of the preview area.
   - Click "Save to Lib" to save the material to the LH asset library.

2. Delete Material
    - Click "Delete from Lib" button. In the pop-up window, select the name of the asset you want to delete and confirm by clicking **"OK"**.



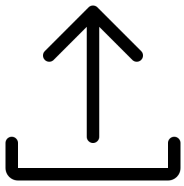
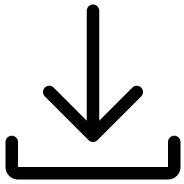
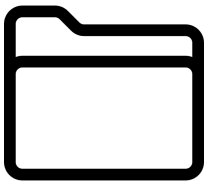
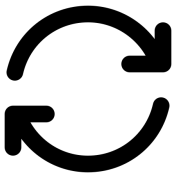
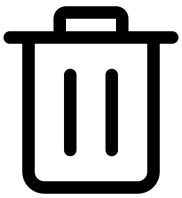
Setup

1. **"Stop ComfyUI"** button: Click the **"Stop ComfyUI"** button to stop ComfyUI.



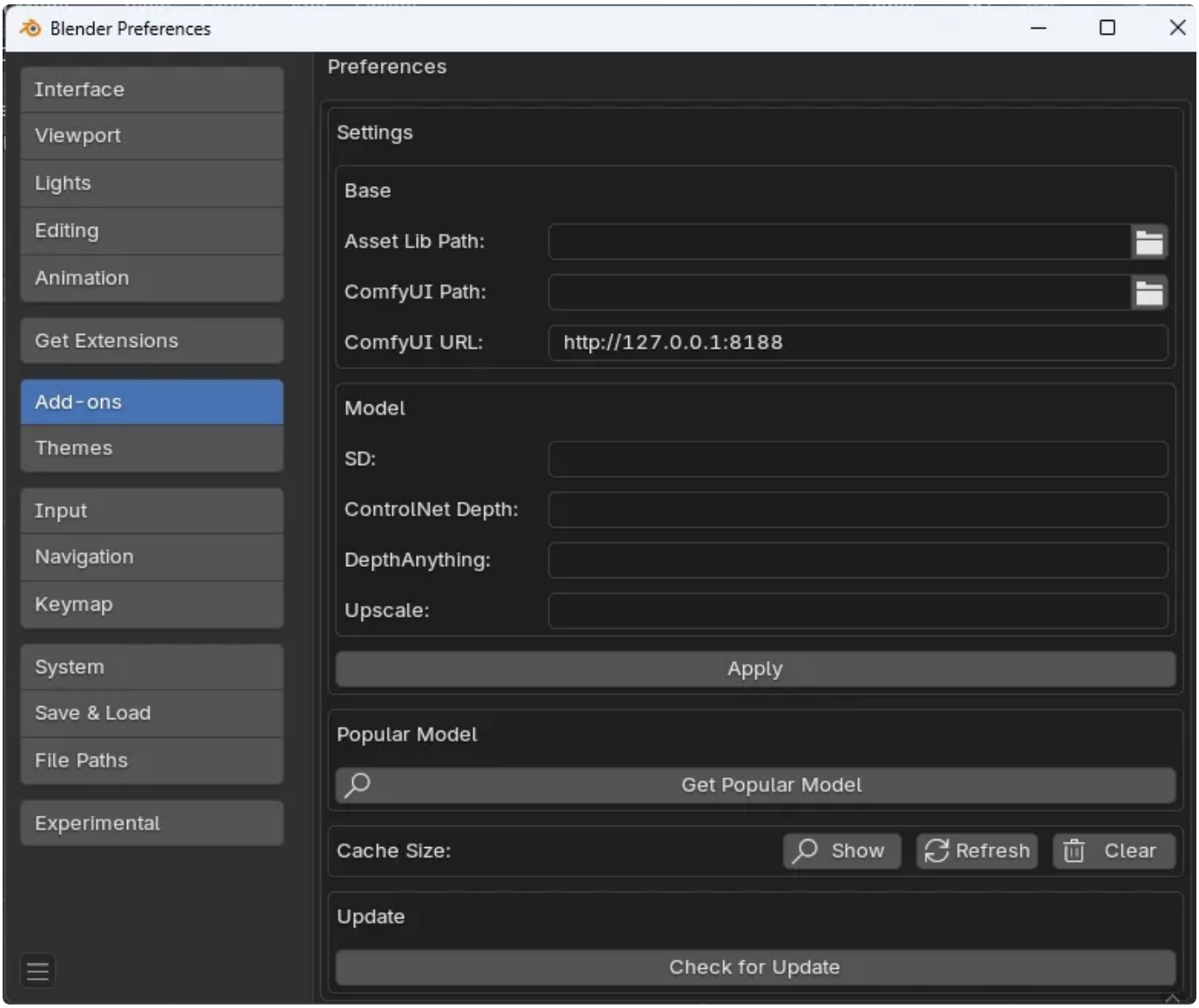
Panel Overviews and Usage Instructions

Icon Introduction

	Open the cache folder to access the generated images
	Upload Image
	Download Image
	Open a file browser
	Refresh cache size
	Clear all cached data

Preference Panel

The Preference Panel allows for centralized configuration and management of various settings.



Function

1. Base Settings
    - Asset Lib Path: Set the path to your asset library folder.
    - ComfyUI Path: Select the ComfyUI path (i.e., the path to the extracted folder from **ComfyUI_windows_nvidia_LH.zip**).
    - ComfyUI URL: Set the ComfyUI startup URL.The default is `http://127.0.0.1:8188` .
2. Model Settings
    - **SD**: Select the SD model.
    - **ControlNet Depth**: Select the ControlNet Depth model.
    - **Depthanything**: Select the Depthanything model.
    - **Upscale**: Select the Upscale model.

- If you have other models, make sure to place them in the corresponding directory. Refer to the file structure below to ensure the models are correctly placed. Only by putting the models in the correct location can they be selected and function properly.

Model Name	File Path
SD	[**Your ComfyUI Path**]/models/checkpoints/
ControlNet Depth	[**Your ComfyUI Path**]/models/controlnet/
DepthAnything	[**Your ComfyUI Path**]/models/depthanything/
Upscale	[**Your ComfyUI Path**]/models/upscale_models/

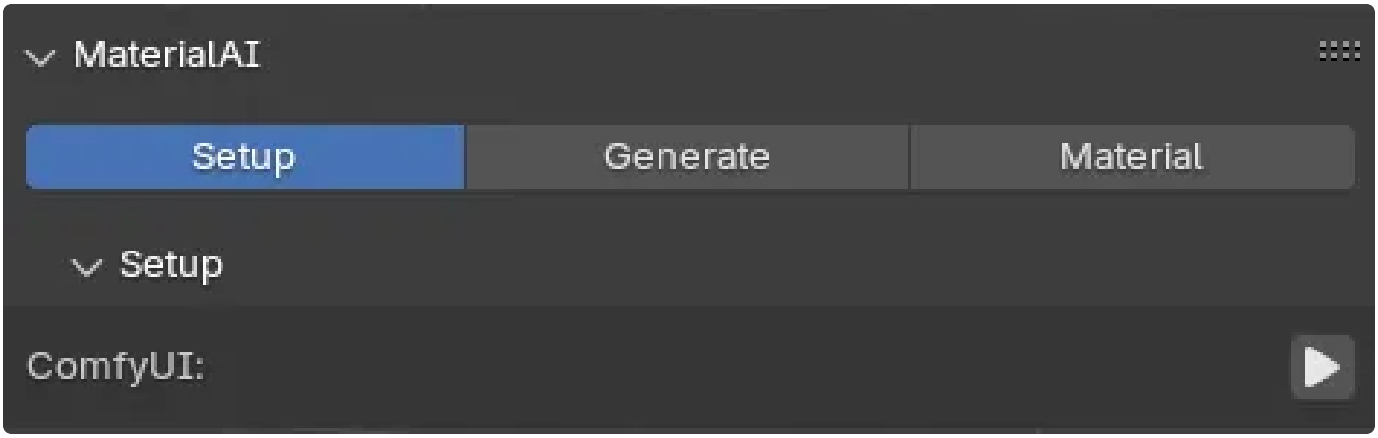
Replace `Your ComfyUI Path` with the actual directory where your **ComfyUI** is installed (wherever you've extracted the **ComfyUI_windows_nvidia_LH.zip**)

  - Popular Model
    - Click "**Get Popular Model**" to view a list of available models.
    - Model list columns
      - Name: The name of the model.
      - Type: The type of the model.
      - Size: The size of the model file, typically shown in MB or GB.
    - Click the **Download** button in the **rightmost column** for the desired model.

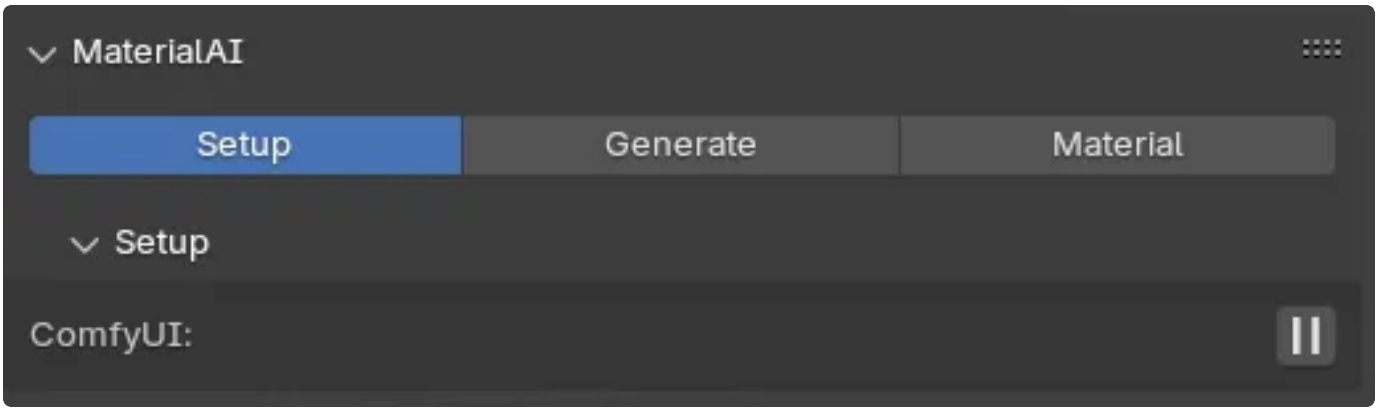
3. Others
   - Cache Size
     - Show: Open the cache folder to access the generated images.
     - Refresh: Refresh cache size
     - Clear: Clear all cached data

Setup Panel

Based on the configured ComfyUI path and port, you can start the service or stop the service for ComfyUI.



Start ComfyUI



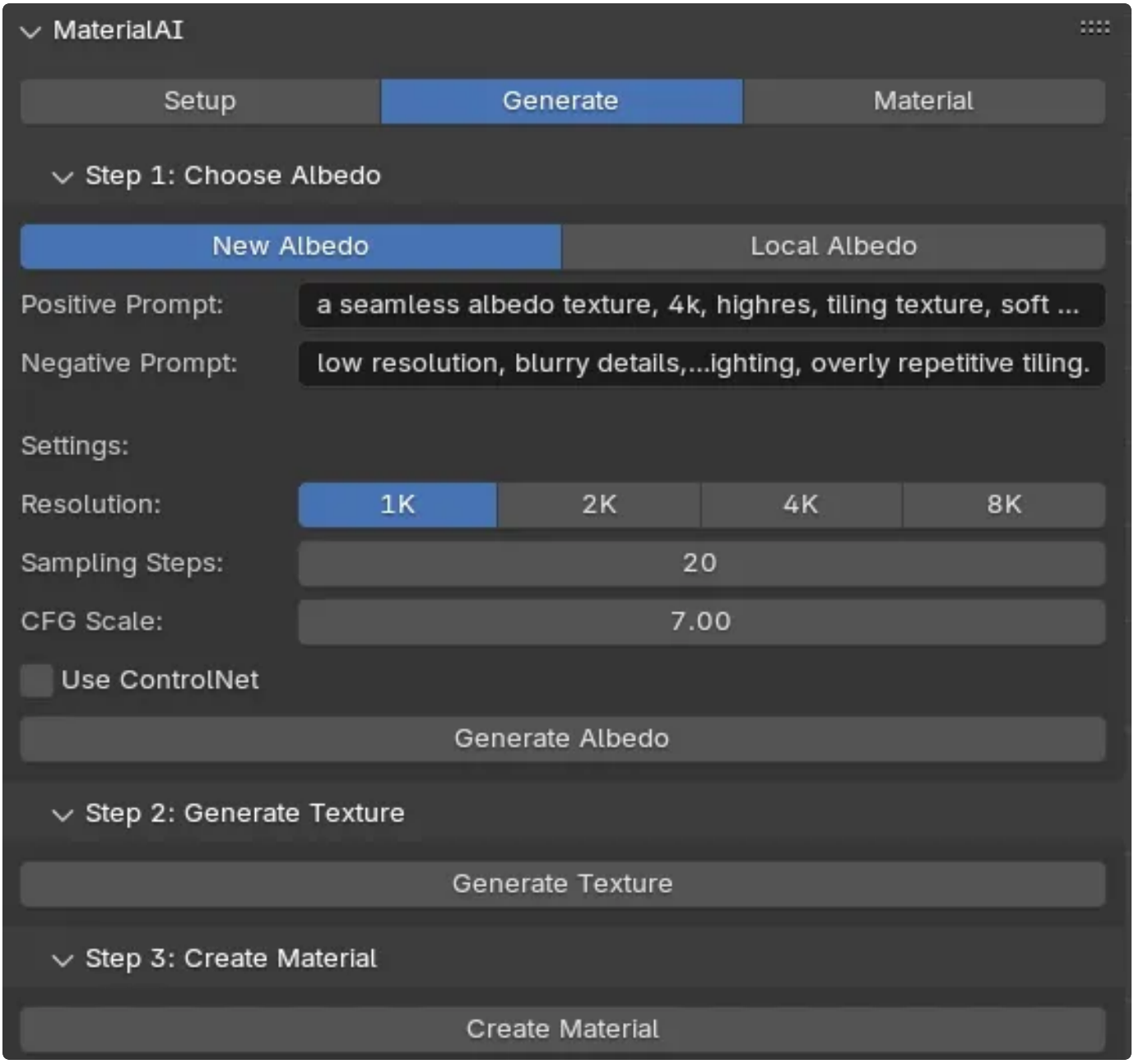
Stop ComfyUI

Function

1. Start ComfyUI
    - Click the button to launch the ComfyUI service.
2. Stop ComfyUI
    - Click the button to terminate the ComfyUI service.

Generate Panel

The Generate Panel is used to create materials and provides ComfyUI settings for generating and saving images that can be used as materials.



Function

1. Generate Albode
    - Prompt: Enter descriptive text to guide the image generation. You can enter multiple words, separated by commas.
    - Negative Prompt: Specify elements to exclude from the image. Multiple prompts can be entered, separated by commas.
    - Resolutin: Image Resolution Options
        - **1K** (1024x1024)
        - **2K** (2048x2048)
        - **3K** (4096x4096)
        - **4K** (8192x8192)

- Sampling Step: Define the number of steps for refining the image. Higher values result in better quality but increase generation time.
- CFG Scale: Adjust the correlation between the generated image and the prompt.
- Use ControlNet: Utilize ControlNet as a reference image for generation.
  - Check the **"Use ControlNet"** option and input the image path.
- Click **"Generate Albedo"** button to produce four different albedo maps for you to choose from.

2. Generate Texture
   - Click **"Generate Texture"** button to generate the **normal**, **displacement**, and **roughness** maps.
3. Create Material
   - Select how the material will appear on objects (plane, sphere, or cube).
   - Enter material name.
   - Click **"Create Material"** to apply the image and create a material in Blender.

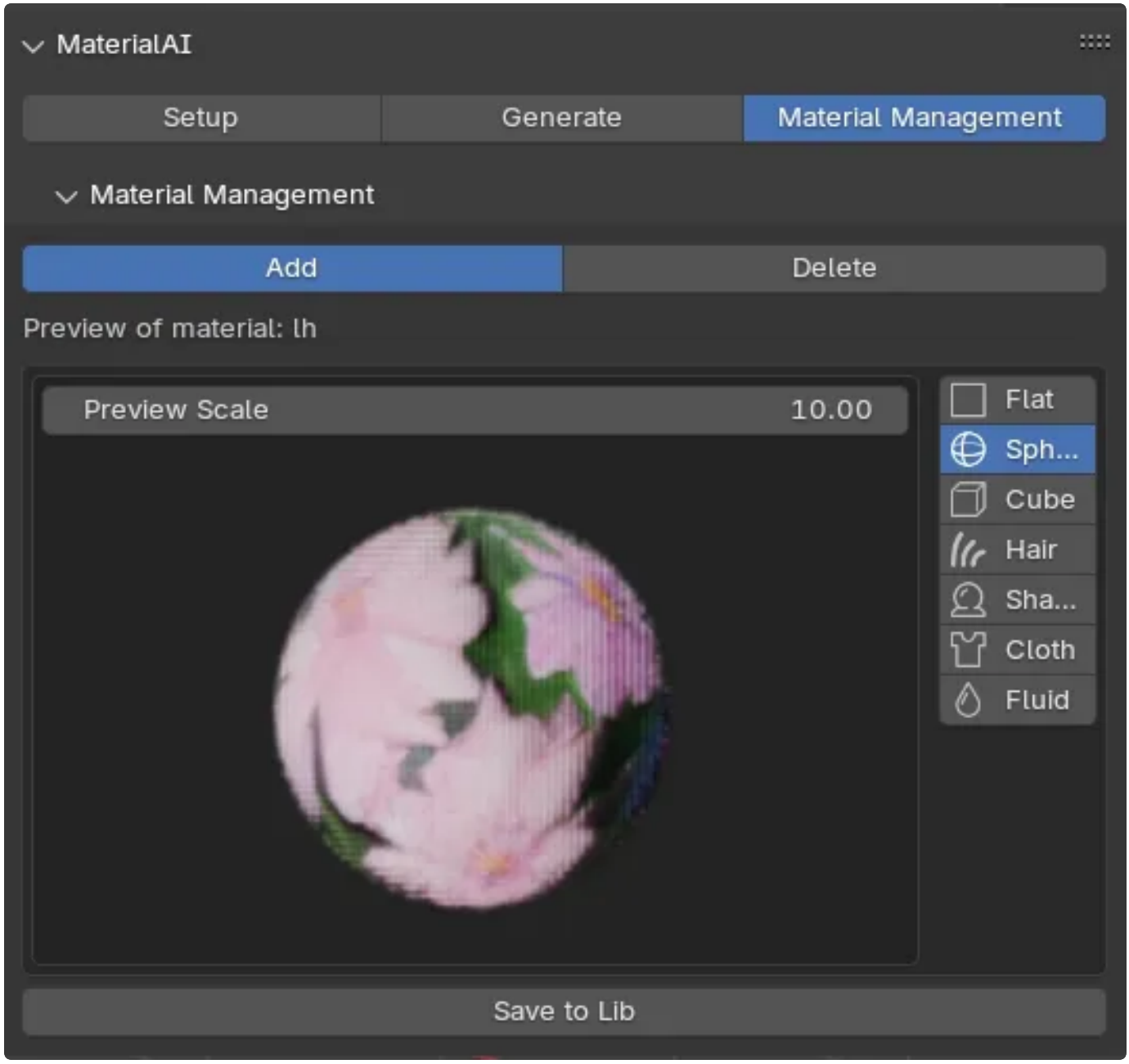
Shader Edit

Parameters

1. Roughness
   - Scale: Adjusts the overall scale of roughness. Higher values make the surface rougher.
   - Offset: Modifies the base roughness value.
   - Randomness: Add randomness, making it appear more natural and irregular
2. Normal
   - Strength: Controls the intensity of the normal map. Higher values create more pronounced bumps, while lower values result in a smoother effect.
   - Scale X: Adjusts the scaling of the normal map along the X-axis.
   - Scale Y: Adjusts the scaling of the normal map along the Y-axis.
   - Scale Z: Adjusts the scaling of the normal map along the Z-axis.
3. Displacement
   - Midlevel: Sets the baseline height for displacement (typically 0.5). Lower values shift displacement downward, while higher values shift it upward.
   - Scale: Controls the overall intensity of displacement, determining the depth and prominence of surface details.
   - Flip: Inverts the displacement direction.

Material Panel

The Material Panel allows users to manage LH materials, providing options to add, preview, save, and delete materials in the LH Asset Library.



Material Management–Add

Material Management–Delete

Function

1. Add material
    - Select the desired render type on the right side of the preview area.
    - Adjust the preview area size by dragging the **Preview Scale** slider located at the top of the preview box to suit your preference.
    - Click **"Save to Lib"** .
    - Fill in the relevant information in the **Save Material** window.
    - click **OK** to save the material to the material library.
2. Delete material
    - Click the **"Delete from Lib"** button.
    - In the pop–up window, select the name of the asset to delete.
    - Click **"OK"** to confirm and remove the material.

Troubleshooting

A Journey Through Challenges

ComfyUI Fails to Start

Imagine you're ready to dive into your creative process, but ComfyUI simply won't start. This could happen if the configured path or port settings are incorrect. Double–check that you've set the correct ComfyUI path and ensured the port isn't being used by another service.

Image Generation Fails

Picture this: you've set everything up and clicked "Generate Image," but nothing happens, or the output isn't what you expected.

This issue could stem from an incomplete setup of the model files or a missing connection to ComfyUI. Ensure your models are correctly placed in their designated paths and that the ComfyUI connection has been successfully tested.

If using ControlNet, verify that the reference image path is valid.

Trying a different prompt or adjusting parameters might also help get things moving.