RTX 3060 Image Manipulation Setup Guide (Windows 11 - 2025)

Complete guide for setting up professional image manipulation on your RTX 3060 12GB running Windows 11.

What You'll Achieve

- Remove people/objects from images
- Replace backgrounds seamlessly
- Restore and colorize old photos
- Professional inpainting/outpainting
- High-quality upscaling to 4K

Prerequisites Checklist

Hardware Confirmation

- ✓ RTX 3060 12GB installed in PCIe slot
- ✓ Power connectors attached
- ✓ Monitor connected and GPU detected in Device Manager

Software Requirements

1. **Update Windows 11** - Run Windows Update completely
2. **Install Latest NVIDIA Driver**
   - Download from: https://www.nvidia.com/download/index.aspx
   - Choose: GeForce RTX 3060 → Windows 11 64-bit → Game Ready or Studio Driver
   - Restart after installation
3. **Verify GPU Detection**
   - Open Task Manager → Performance tab
   - Confirm "GPU 0 - NVIDIA GeForce RTX 3060" appears

Recommended Stack (2025)

Primary Setup: ComfyUI + Flux.1-dev (FP8) + ControlNet

- Best quality-to-performance ratio for 12GB VRAM
- State-of-the-art results as of 2025
- Fully local (no cloud subscriptions)

Alternative Options:

- **Draw Things** (Mac/iOS only - skip if Windows)
- **Fooocus** (simpler than ComfyUI, good for beginners)
- **Cloud options:** fal.ai, Replicate, Photoshop Firefly

Step 1: Download Core Files

A. ComfyUI Portable (Required)

- **Download:** https://github.com/comfyanonymous/ComfyUI/releases
- Look for: `ComfyUI_windows_portable_nvidia_cu121_or_cpu.7z` (cu121 is current as of late 2024/2025)
- Extract to: `C:\ComfyUI\` or `D:\ComfyUI\` (avoid paths with spaces)

B. Flux.1-dev Model (FP8 - Critical for 12GB)

- **Download:** https://huggingface.co/Kijai/flux-fp8/blob/main/flux1-dev-fp8.safetensors
- Size: ~17GB
- Save to: `ComfyUI\models\checkpoints\`

C. ControlNet Models (For precise control)

Download both and place in `ComfyUI\models\controlnet\`:

- **Depth:** https://huggingface.co/Shakker-Labs/FLUX.1-dev-ControlNet-Depth/tree/main
  - Get: `diffusion_pytorch_model.safetensors` (rename to `flux-controlnet-depth.safetensors`)
- **Canny:** https://huggingface.co/Shakker-Labs/FLUX.1-dev-ControlNet-Canny/tree/main
  - Get: `diffusion_pytorch_model.safetensors` (rename to `flux-controlnet-canny.safetensors`)

D. Upscaler (For 4K outputs)

- **Download:** https://huggingface.co/ai-forever/Real-ESRGAN/blob/main/RealESRGAN_x4.pth
- Save to: `ComfyUI\models\upscale_models\`

Step 2: Initial ComfyUI Setup

Launch ComfyUI

1. Navigate to your ComfyUI folder (e.g., `C:\ComfyUI\`)
2. Double-click `run_nvidia_gpu.bat`
3. Wait for console to show: "To see the GUI go to: http://127.0.0.1:8188"
4. Open your browser to: http://localhost:8188

Install ComfyUI Manager (Essential)

1. In ComfyUI, click **Manager** button (bottom right)
2. If Manager isn't installed:
   - Close ComfyUI (Ctrl+C in console)
   - Navigate to `ComfyUI\custom_nodes\`
   - Open Command Prompt here and run:

```
git clone https://github.com/ltdrdata/ComfyUI-Manager.git
```

- Restart ComfyUI

Install Essential Custom Nodes

Via Manager → Install Custom Nodes, search and install:

- ✓ **ComfyUI-Impact-Pack** (segmentation, face detection)
- ✓ **ComfyUI-SAM** (Segment Anything Model)
- ✓ **ComfyUI-Advanced-ControlNet**
- ✓ **ComfyUI-Essentials**

Restart ComfyUI after installations.

Step 3: Get Workflows

Method 1: Import from OpenArt (Easiest)

1. Visit these URLs and download the workflow JSON:
   - **Background Removal:** https://openart.ai/workflows/flux-realistic-background-replace
   - **Photo Restoration:** https://openart.ai/workflows/flux-old-photo-restoration-colorization
2. In ComfyUI, drag the `.json` file onto the canvas
3. Manager will prompt to install missing nodes - click "Install"

Method 2: Build From Scratch

- Use the workflow builder in ComfyUI
- Connect nodes: Load Image → Flux Sampler → ControlNet → Save Image

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Step 4: Verification Test

Quick Test - Text to Image

1. In ComfyUI default workflow, change the checkpoint to `flux1-dev-fp8.safetensors`
2. Enter prompt: "a red apple on a wooden table, photorealistic"
3. Click **Queue Prompt**
4. **Expected:** Image generates in 10-20 seconds
5. Check console for VRAM usage (should stay under 11GB)

If Errors Occur:

- **"Out of memory"** → Reduce resolution to 512x512, confirm FP8 model selected
- **"Model not found"** → Check file is in correct `models\checkpoints\` folder
- **"CUDA error"** → Restart PC, verify NVIDIA driver installed

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Step 5: Common Workflows

A. Remove Person & Replace Background

Setup:

1. Load the "Background Replace" workflow
2. Upload your source image
3. Use the masking tool to select the person/object
4. Enter background prompt: `"sandy beach at sunset, dramatic sky, photorealistic"`

Settings for RTX 3060:

- Resolution: 1024x1024 (upscale later)
- Steps: 20-30
- CFG Scale: 7.0
- Sampler: Euler A

Generate Time: ~12-25 seconds per image

B. Old Photo Restoration & Colorization

Setup:

1. Load the "Photo Restoration" workflow
2. Upload damaged/B&W photo
3. Let the workflow auto-detect faces and damage
4. Click generate

What It Does:

- Repairs scratches and tears
- Colorizes B&W photos
- Enhances faces
- Upscales to higher resolution

Generate Time: ~20-40 seconds depending on image size

Optimization Tips for 12GB VRAM

Always Use:

- ✓ **FP8 models** (flux1-dev-fp8.safetensors)
- ✓ **Batch size = 1**
- ✓ **Start at 1024x1024**, upscale after

If Out of Memory:

1. Lower resolution to 768x768 or 512x512
2. Enable "Low VRAM mode" in Settings → System
3. Use tiled ControlNet (processes image in sections)
4. Close other GPU applications (browsers with hardware acceleration)

For Best Quality:

1. Generate at 1024x1024
2. Use Ultimate SD Upscale node to 4K
3. Apply light denoising (0.3-0.4) during upscale

Advanced: Face Enhancement

For portrait work, add these models:

CodeFormer (face restoration):

- Download: https://huggingface.co/sczhou/CodeFormer/blob/main/codeformer.pth
- Place in: `ComfyUI\models\facerestore_models\`

GFPGAN (alternative face enhancer):

- Download: https://github.com/TencentARC/GFPGAN/releases
- Place in: `ComfyUI\models\facerestore_models\`

Use in workflows via "FaceDetailer" nodes (Impact Pack).

Troubleshooting

ComfyUI Won't Start

- Verify NVIDIA driver is latest version
- Try `run_cpu.bat` to check if it's GPU-specific
- Check Windows Firewall isn't blocking port 8188
- Run `run_nvidia_gpu.bat` as Administrator

Models Not Appearing in Dropdowns

- Confirm files are `.safetensors` or `.pth` format
- Check exact folder path matches workflow expectations
- Click "Refresh" in model selector
- Restart ComfyUI completely

Slow Generation (>60 seconds)

- Confirm GPU is actually being used (check Task Manager → Performance → GPU)
- Your system might be using CPU fallback - check console logs
- Reduce resolution or steps
- Close Chrome/Firefox (they use GPU memory)

"Connection Refused" in Browser

- ComfyUI process might have crashed - check console for errors
- Try different browser
- Check if another app is using port 8188

File Organization Reference

```
ComfyUI/
├── models/
│   ├── checkpoints/          (Flux, SDXL models)
│   ├── controlnet/           (ControlNet models)
│   ├── upscale_models/       (ESRGAN, Real-ESRGAN)
│   ├── facerestore_models/   (CodeFormer, GFPGAN)
│   ├── loras/                (LoRA fine-tunes)
│   └── clip/                 (CLIP models if needed)
├── custom_nodes/             (Plugins, Manager)
└── output/                   (Generated images)
```

Essential Bookmarks

- **ComfyUI Releases:** https://github.com/comfyanonymous/ComfyUI/releases
- **Flux FP8 Models:** https://huggingface.co/Kijai/flux-fp8
- **OpenArt Workflows:** https://openart.ai/workflows
- **CivitAI Models:** https://civitai.com/models
- **ComfyUI Wiki:** https://github.com/comfyanonymous/ComfyUI/wiki

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Quick Start Checklist

- [ ] NVIDIA driver installed and GPU detected
- [ ] ComfyUI portable downloaded and extracted
- [ ] Flux FP8 model in checkpoints folder
- [ ] ComfyUI Manager installed
- [ ] Impact Pack installed
- [ ] Test workflow runs successfully
- [ ] ControlNet models downloaded (optional but recommended)
- [ ] Upscaler model downloaded for 4K outputs

Performance Expectations (RTX 3060 12GB)

Task	Resolution	Time
Text-to-Image	1024x1024	12-18s
Inpainting	1024x1024	15-25s
Background Replace	1024x1024	15-30s
Photo Restoration	Variable	20-40s
Upscale to 4K	Post-process	5-10s

Legal & Ethical Notes

- Respect copyright - don't manipulate images you don't own
- Don't create deepfakes or misleading content
- Don't generate images impersonating real people without consent
- Be transparent when sharing AI-edited images
- Follow platform guidelines for AI-generated content

Next Steps

1. **Run the test workflow** - Verify everything works
2. **Experiment with prompts** - Learn what produces best results
3. **Try the restoration workflow** - Great for family photos
4. **Join communities:**
   - r/StableDiffusion
   - r/comfyui
   - ComfyUI Discord

Need help? Check the ComfyUI GitHub Issues or ask in the Discord community.

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