WARLOCK-STUDIO

AI Upscaling & Interpolation Suite

Version 5.1

USER OPERATING MANUAL

Developed by Ivan-Ayub97

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Contents

1 INTRODUCTION

Warlock-Studio is a comprehensive GUI application designed for AI-driven image and video enhancement. It integrates state-of-the-art neural networks to perform Upscaling, Denoising, Face Restoration, and Frame Interpolation.

Built on Python, CustomTkinter, and ONNX Runtime, Warlock-Studio optimizes hardware resources (CPU and GPU) to deliver great results.

System Requirements

- **OS:** Windows 10/11 (x64)
- **RAM:** Minimum 8GB (16GB+ recommended)
- **GPU:** NVIDIA (CUDA), AMD/Intel (DirectML), or CPU (Slow fallback)
- **Dependencies:** FFmpeg (included in assets), Visual C++ Redistributable.

2 INTERFACE OVERVIEW USAGE

The interface is divided into functional blocks designed for a linear workflow: *Load* → *Configure* → *Process*.

2.1 1. Input Section

Located on the left side (or top, depending on layout), this area handles file ingestion.

- **Drag & Drop:** You can drag images or videos directly onto the window.
- **Manual Select:** Clicking the button opens a file dialog.
- **File List:** Selected files appear in a scrollable list showing resolution, duration, and calculated output resolution based on current settings.

2.2 2. AI Configuration

This is the core control panel.

AI Model: Selects the neural network architecture (see Chapter 3).

AI Multithreading: Controls how many frames are processed simultaneously.

- *Recommendation:* Set to "2 threads" for mid-range GPUs. Use "OFF" (1 thread) for high-resolution upscaling (4K) to save VRAM.

Frame Generation (RIFE): Only active when RIFE models are selected. Interpolates frames to increase smoothness (e.g., 30fps → 60fps).

2.3 3. Hardware Performance

- **GPU Selection:** Choose specific GPU or "Auto".
- **VRAM Limiter: Crucial Setting.** This defines the tile size for processing.
  - *Integrated Graphics:* Set to 2GB or lower.

– *Dedicated GPU (e.g., RTX 3060):* Set to match your card's VRAM (e.g., 6GB-8GB).

Tiling Technology

Warlock-Studio uses "Tiling". If an image is too large for VRAM, it splits the image into small squares, processes them, and merges them back. The **VRAM Limiter** controls the size of these squares.

2.4 4. Resolution Control

- **Input Resolution %:** Downscales the image *before* AI processing. Useful for speeding up 4K video processing (e.g., set to 50%).
- **Output Resolution %:** Downscales the image *after* AI processing.

2.5 5. Output Settings

- **Image Ext:** PNG (Lossless), JPG (Fast), BMP/TIFF (Uncompressed).
- **Video Ext:** MP4, MKV, AVI, MOV.
- **Video Codec:**
  - **x264/x265:** CPU Encoding (High quality, slow).
  - **NVENC:** NVIDIA Hardware (Fast).
  - **AMF:** AMD Hardware.
  - **QSV:** Intel Hardware.

3 AI MODELS LIBRARY

Warlock-Studio includes varied models optimized for specific scenarios. Use this table to choose the right tool.

WarlockDark		
Denoising	IRCNN_Mx1	Removing grain/noise without changing resolution. Fast.
	IRCNN_Lx1	Heavier denoising for very grainy sources.
Anime / Art	RealESR_Animex4	**Best for Cartoons/Anime.** Removes compression artifacts and sharpens lines.
	RealESR_Gx4	General purpose fast upscaling.
Realistic	BSRGANx4	**Best for Real World video.** Adds texture and realistic details.
	BSRGANx2	2x version of above. Slightly faster.
	RealESRGANx4	Good balance between sharpness and texture.
	RealESRNetx4	Smoother look, less texture hallucination.
Faces	GFPGAN	**Face Restoration.** Miraculous recovery of blurry/small faces.
Interpolation	RIFE / Lite	Increasing Frame Rate (30→60fps). Creates intermediate frames.

Table 1: Warlock-Studio Model Reference Guide

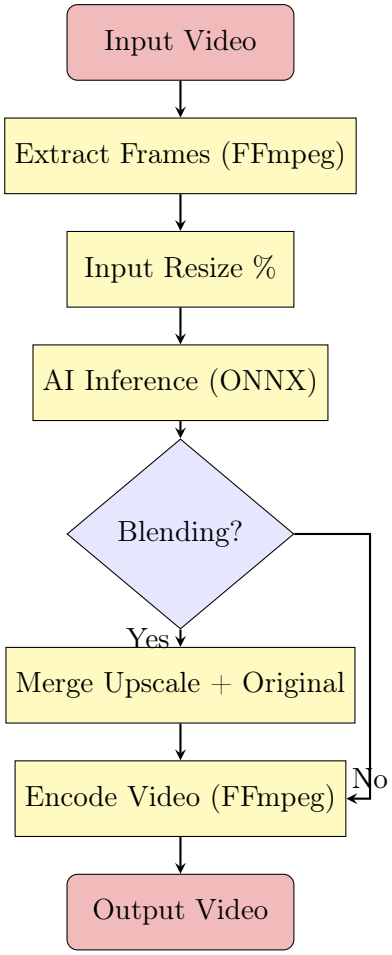
When NOT to use certain models:

- Do **not** use *RealESR_Animex4* on realistic photos; it will make skin look like plastic (oil painting effect).
- Do **not** use *GFPGAN* on non-human subjects or high-quality faces (it might alter facial features slightly).

4 PROCESS WORKFLOWS

4.1 Video Upscaling Pipeline

Understanding the internal process helps in troubleshooting speed issues.


Input Video
Extract Frames (FFmpeg)
Input Resize %
AI Inference (ONNX)
Blending?
Yes
Merge Upscale + Original
Encode Video (FFmpeg)
No
Output Video

5 TROUBLESHOOTING ERROR CODES

The integrated console (bottom of the app) provides real-time logs. Here are common errors and fixes.

5.1 Common Runtime Errors

WarlockRed	
CUDA / Out of Memory	The AI model requires more VRAM than available. **Fix:** Lower the "GPU VRAM" setting (e.g., set to 2). Lower "AI Multithreading" to OFF.
FFmpeg not found	The application cannot process video/audio. **Fix:** Ensure `ffmpeg.exe` is in the `Assets/` folder.
Gray/Black Output	Often caused by incompatible Video Codecs. **Fix:** Switch output codec to `x264` (Software) or check GPU driver updates.
Process Stops Immediately	File path issue. **Fix:** Avoid special characters or emojis in filenames/folders. Move files to a simple path like `C:/Upscale/`.
DLL Load Failed	Missing Visual C++ dependencies. **Fix:** Install latest MSVC Redistributable.

Checkpoint Recovery

If the app crashes during a long video upscale, **do not delete the temporary folder**. Warlock-Studio will detect the processed frames and resume from where it left off automatically upon restarting the same job.

5.2 Performance Tuning Tips

- **Slow Speed?** Ensure "Process Priority" in Preferences is set to "High". Check if you are using CPU instead of GPU (Console will say `CPUExecutionProvider`).
- **Low Quality?** Try disabling "Blending" (set to OFF). Increase "Input Resolution %" to 100.
- **Glitchy Video?** If using Interpolation (RIFE), scene changes might look weird. This is a limitation of current AI flow generation.

6 PREFERENCES MENU

Accessible via the ⚙ icon in the top right.

- **App Theme:** Switch between Dark/Light modes.
- **ONNX Provider:** Force specific backend (CUDA vs DirectML). *Auto* is recommended.
- **Clean Temp Files:** Removes leftover `.tmp` files and frame folders from crashed sessions.
- **Extended Logging:** Enables detailed debug logs for error reporting.

Warlock-Studio is an open-source tool.
Thank you for using it.