**Super Resolution Using Deep Learning**

To upscale **thermal images** using the official **Real-ESRGAN** repository and the **RealESRGAN\_x{any model u need} plus** model, outputting high-resolution results (e.g., 2560×2048 pixels or whatever the resolution needed) while ensuring compatibility and avoiding common errors.

## **Requirements**

* Python 3.10+
* PyTorch (CPU or GPU)
* CUDA 11+
* Real-ESRGAN dependencies

**Steps for downloading and installation:**

1. pip install realesrgan
2. git clone https://github.com/xinntao/Real-ESRGAN.git
3. cd Real-ESRGAN
4. pip install -r requirements.txt
5. python inference\_realesrgan.py -n RealESRGAN\_x2plus **(what this will do is install the required .pth weights according to your needs)**
6. pip install -e . --user
7. pip install basicsr facexlib gfpgan –U **(for GPU Support)**
8. pip install -r requirements.txt
9. pip install -e . --user
10. pip install torch torchvision --index-url https://download.pytorch.org/whl/cu121 **(For CUDA GPU)**
11. python inference\_realesrgan.py -n RealESRGAN\_x2plus **(FOR CUDA GPU same)**

**FOR CUDA VERSION CHECK:**

nvcc --version

**Got the latest version as 11.5, so the command for it is:**

*pip install torch==1.11.0+cu115 torchvision==0.12.0+cu115 --extra-index-url https://download.pytorch.org/whl/cu115*

**FOR checking the installation:**

1. cd ~/Real-ESRGAN
2. python inference\_realesrgan.py -n RealESRGAN\_x2plus -i inputs/your\_image.jpg ***(insert your image path according to your PC)***

**Output:**  
 Testing 0 pic......   
 **the output will be saved inside the *results* folder of Real-ESRGAN**

-------------------------------------------------------------------------------------------------

**Batch Script with Official Real-ESRGAN**

Will build your **batch processing script** using **RRDBNet** (the real model) and the same internal logic used by inference\_realesrgan.py.

* Load the pretrained **RRDBNet** model (x4)
* Use the **RealESRGANer** inference wrapper (used in inference\_realesrgan.py)
* Load and upscale each **(640×512)** image **(in this case.....any res app)**
* Resize to **1280×720 (in this case.... You can do upto 2560x2080)**
* Save the result to another folder.

**--------------------------------------------------------------------------------------------------**

**For more info and code-related queries, refer to the github repository of RnD-Indowings/Super-Resolution-DL**

**Best PRE-Trained Models for Super Resolution:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Model Name** | **Upscale Factor** | **Content Type** | **Notes** |
| RealESRGAN\_x4plus | 4× | General Photos | Most widely used model for real-world images |
| RealESRGAN\_x4plus\_anime\_6B | 4× | Anime / Drawings | Specifically tuned for anime-style line art |
| RealESRGAN\_x2plus | 2× | General Photos | Lower scale version; good for light enhancement |
| RealESRNet\_x4plus | 4× | General Photos | Similar to x4plus but without GAN component (faster, less sharp) |
| RealESRGAN\_x2plus\_anime\_6B | 2× | Anime / Drawings | 2× version for anime images |
| realesr-general-x4v3 | 4× | General (v3) | General model with fewer artifacts (newer and more balanced) |