
Tutorial
V 1.0
Multidiffusion upscaler
How to use + workflow

Table of Contents

1. Disclaimer....3
2. Getting started....3
3. What does Multidiffusion upscaler do?....3
4. Installing Multidiffusion upscaler....4
5. Settings of Multidiffusion upscaler....5
    5.1 Tiled diffusion....5
    5.2 Region prompt control....6
    5.3 Tiled VAE....7
    5.4 IMG2IMG Settings....7
    5.5 Tiled diffusion inpaint....7
6 Multidiffusion + Hires. Fix + IMG2IMG workflow....8
    6.1 The prompt, model, VAE....8
    6.2 First step, settings for finding seed....9
    6.2 Second step, Hires generate....10
    6.3 Third step IMG2IMG enhance....11
    6.4 Results....12
7 Bonus inpaint....13
8 The end....14

1. Disclaimer

This is mainly tutorial on **personal workflow** on how i use multidiffusion upscaler for automatic1111. I might get something wrong and if you spot something wrong with tutorial, please leave a comment. Any feedback is welcome. Tutorial page https://civitai.com/models/34726

I am not the creator of this extension and i am not in any way related to them. They can be found from Github page below. Please show some love for them if you have time :).

https://github.com/pkuliyi2015/multidiffusion-upscaler-for-automatic1111

2. Getting started

After this tutorial hopefully you have some understanding of the extension. If you have any questions you can leave comment on the tutorial page in civitai https://civitai.com/models/34726 and I will answer when I have time.

In this part of tutorial we will go through:

1. What does Multidiffusion upscaler do?
2. How to install Multidiffusion upscaler extension for automatic1111 WEB UI (might work with other WEB UI extensions)
3. The settings of Multidiffusion upscaler.
4. My workflow how I use multidiffusion upscaler with Hires.fix + IMG2IMG.

3. What does Multidiffusion upscaler do?

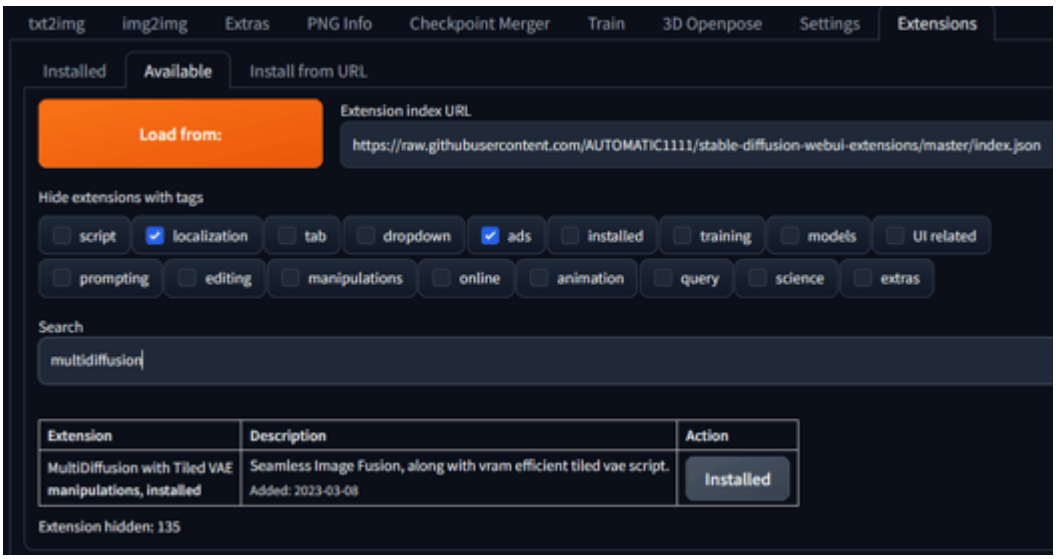
To put it short. The extension is extremely powerful tool for enhancing the quality and size of images with less ram usage. The extension uses tiling, which means it generates the image in parts. In simple terms for example 512 x 512 generated with 64 x 64 tiling will do 8 x 8 amount of tiles for the image *(It is a bit more complicated than that but general idea is the same)*. Thanks to tiling it will use less ram, and generating huge images becomes possible. Also it has tiled VAE, which lets you tile VAE. There are several more features I will briefly explain in below.

More detailed information can be found from the github page
https://github.com/pkuliyi2015/multidiffusion-upscaler-for-automatic1111#tiled-diffusion

4. Installing Multidiffusion upscaler

You can either download it from the github or download it straight from stable diffusion webui -> extensions tab -> available -> press load -> and search for multidiffusion (i recommend doing this way, as the extensions installed this way become available in installed tab and you can disable/enable it if you want).

IMPORTANT: AFTER INSTALLING AND RELOADING, CLOSE THE WEBUI CMD COMPLETELY, NOT JUST RELOAD. Otherwise it might have some issues.

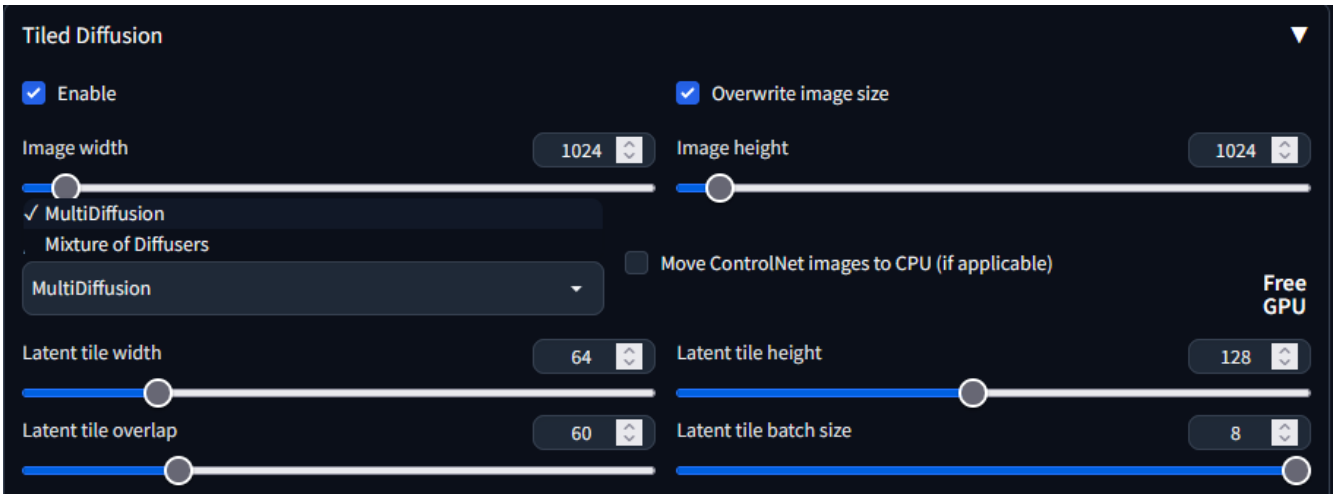


5. Settings of Multidiffusion upscaler

The extension adds a lot of stuff that might look overwhelming at the first sight, but i can guarantee it is pretty simple to use and straightforward once you learn the knobs. There is nothing overly complicated.

5.1 Tiled diffusion

First we will look at the tiled diffusion settings. That gets added with the extension



Enable: Enables the tiled diffusion

overwrite image size: With this setting you can do images larger than the webui normally allows. You can go up to 16384 x 16384

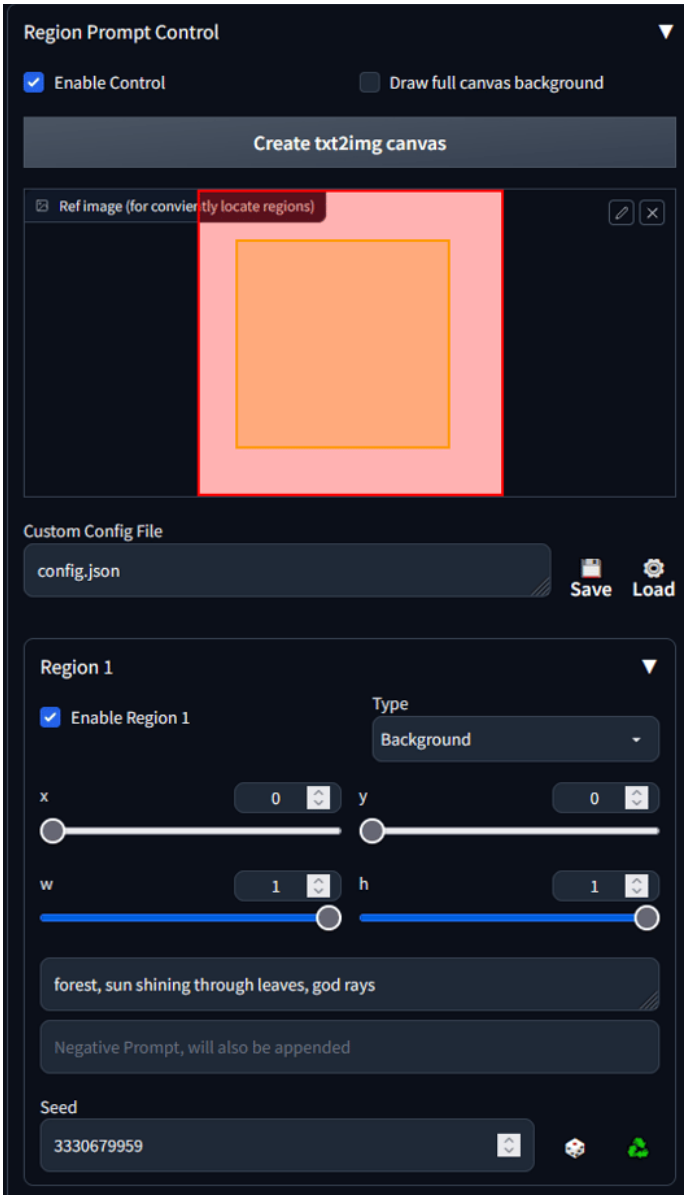
Method: There are 2 methods. Multidiffusion and mixture of diffusers. I generally use multidiffusion as it is faster, image takes 3 times longer to generate with mixture of diffusers. Multidiffusion and mixture of Diffusers give slightly different results. Test both and feel which works better for you.

Latent tile width and height: With this settings you change the tile width and height for the image. From personal testing it seems to work better if you have either width or height higher depending on your image width and height. With thumb rule of divided by 8.5-10~ of your image resolution it will work well most of the time. In the image I have 64 x 128. I was generating image which was 620 x 877 for the cover in the first page.

Latent tile overlap: How much the tiles overlap with each other. Rising it higher makes the generate time longer, but reduces inconsistency in the image. From personal testing, if you have one of the width or height higher and use Hires. Fix, it is pretty good idea to have close to the lower value, as when the hires. Fix kicks in and the overlap is too low, the image will have strange things happening in.

Latent tile batch size: This will increase how many of the tiles will be generated at the same time. If you have enough VRAM on your GPU i recommend keeping it at 8. This does not affect the quality of image, but can affects the time heavily.

5.2 Region prompt control



Region prompt control is extremely useful tool if you want to have more control over your picture.

Enable: Enables region prompt control for tiled diffusion, tiled diffusion must be enabled for it to work.

Draw full canvas background: According to the github *"If you want to add objects to a specific position, use regional prompt control and enable draw full canvas background"*. How i understand is, if you don't use background in region prompt control and only use foreground to add object to your image use this.

Create txt2img canvas: Clicking this will create the empty canvas area that is the size of the image you are about to generate. Every time you change your width and height you have to press this again. Otherwise the generation results are not accurate.

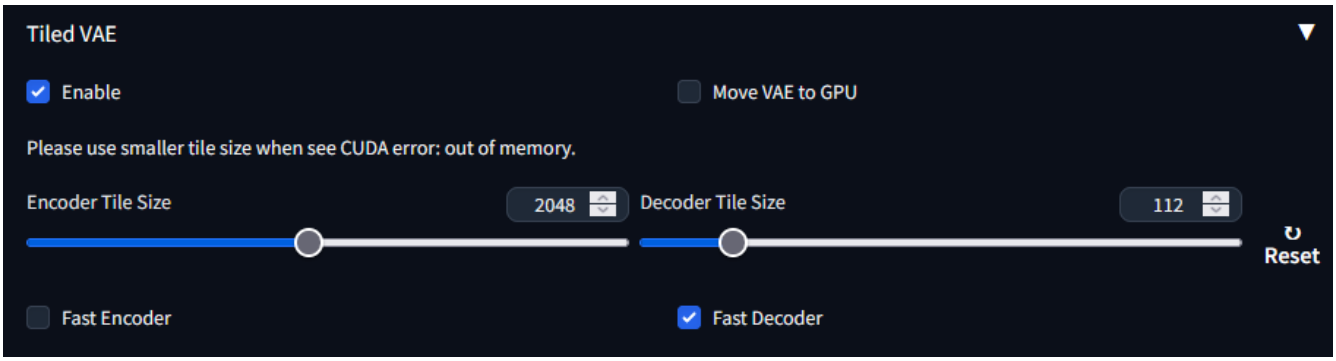
The canvas area that is created shows the enabled regions. You can move/resize them from the region Z/Y/W/H sliders or from the canvas with mouse.

Type background and foreground: Background acts as an background. Usually region that fills the whole canvas. Foreground gives new setting called feather. Feather in other words is blending/smoothing. With 0 the foreground region will not be feathered at all and 100 the image will be completely feathered to background. Rest should be pretty easy to understand.

5.3 Tiled VAE

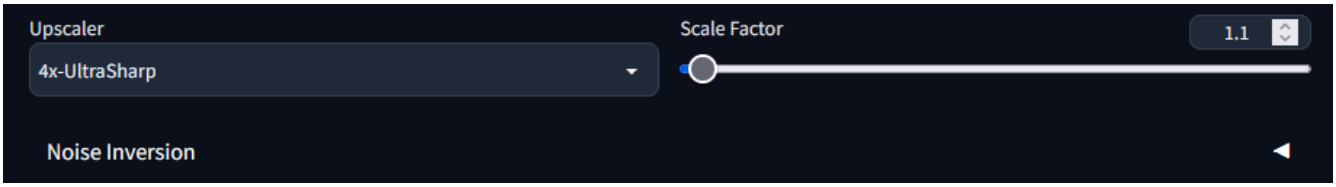
Tiled vae is pretty easy to understand and can be enabled always. If the VAE is tiny and unnecessary to tile, it will not use it.

These are settings I use most of the time. If you run out of VRAM, lower the tile sizes and that should fix the problem. Fast encoder is enabled by default, I disable it because sometimes it causes some weird colors.



5.4 IMG2IMG Settings

There are several settings that are only visible in IMG2IMG.



Multidiffusion allows you to upscale images in IMG2IMG. This is very powerful and I will be using it in the workflow. The settings itself are pretty simple. The upscaler I use mostly is called 4x-UltraSharp. It can be found from https://upscale.wiki/wiki/Model_Database .

I have not personally used noise inversion much, so I won't touch this topic. You can find some information from the github page https://github.com/pkuliyi2015/multidiffusion-upscaler-for-automatic1111#-tiled-noise-inversion

5.5 Tiled diffusion inpaint

Tiled diffusion can be used in inpainting. Remember to put scale factor 1 and upscaler to none when using in inpainting. If those are set to something else, it will affect the whole image, even if inpaint area is set to "Only masked".

6 Multidiffusion + Hires. Fix + IMG2IMG workflow

In this part of the tutorial I will go through workflow that I find good. You might want to experiment with settings and find what works best for you.

6.1 The prompt, model, VAE

For prompt I will be using:

_____

Positives:

masterpiece, best quality, (grainy:0.7), intricate detail, sharp, perfect anatomy, finely detailed, bloom, noon, vivid colors

BREAK

cute girl, Walking dog, leash in hand, detailed eyes, from behind, multicolored summer dress, twintails, detailed trees, autumn, grass, (solo:1.3), smiling

BREAK

Rural city background

Negatives:

(low quality, worst quality:1.5), [Unspeakable-Horrors-16v:Unspeakable-Horrors-24v:0.5],

_____

Negative textual inversion I use can be found from civitai
https://civitai.com/models/4499/unspeakable-horrors-negative-prompt

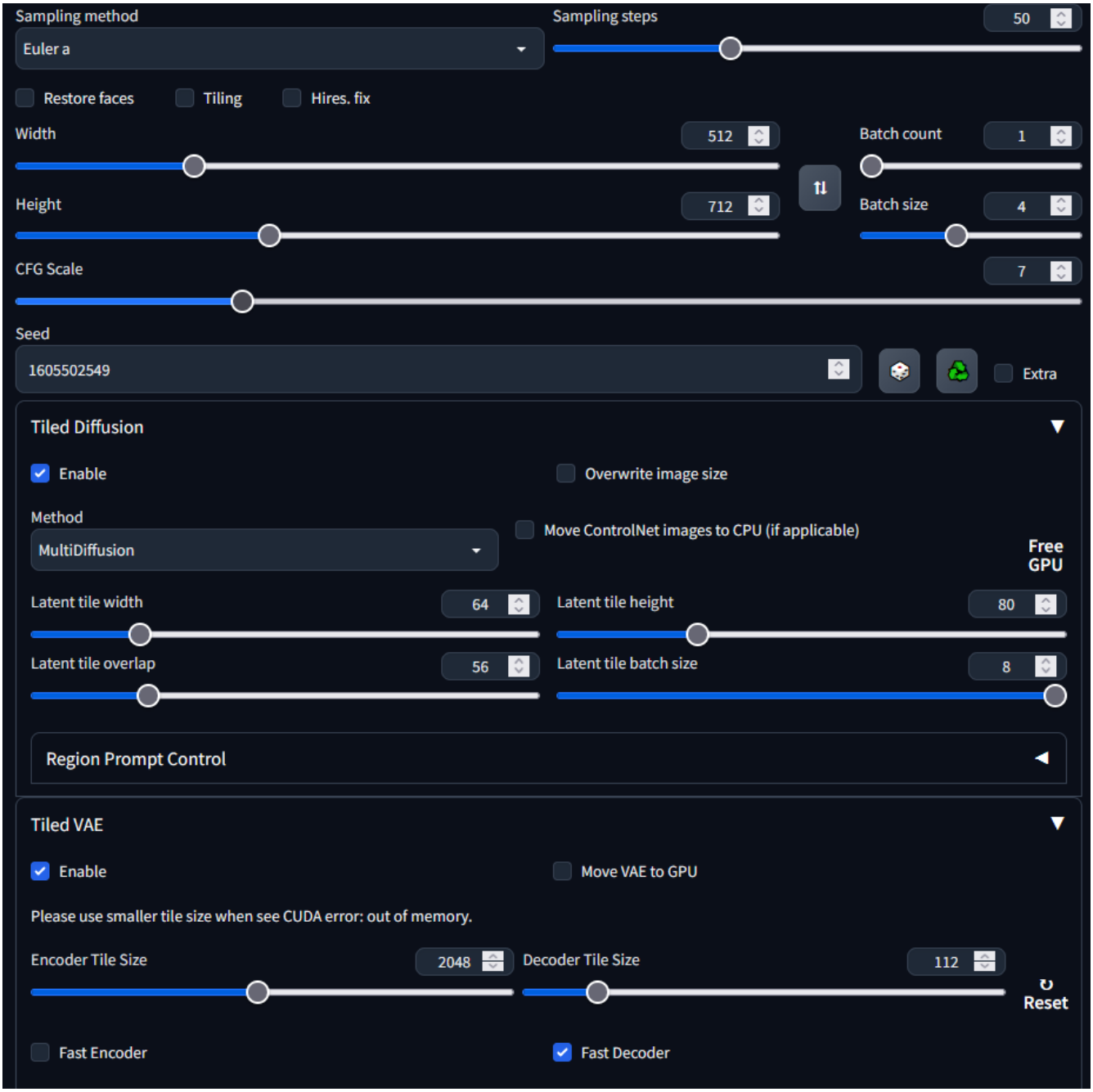
Model I will be using is BreakDro _i1464. Can be found from
https://civitai.com/models/28828/breakdro?modelVersionId=53149

VAE is somewhat personal preference, for this I will be using VAE called BerrysMix2.

Clip skip 2

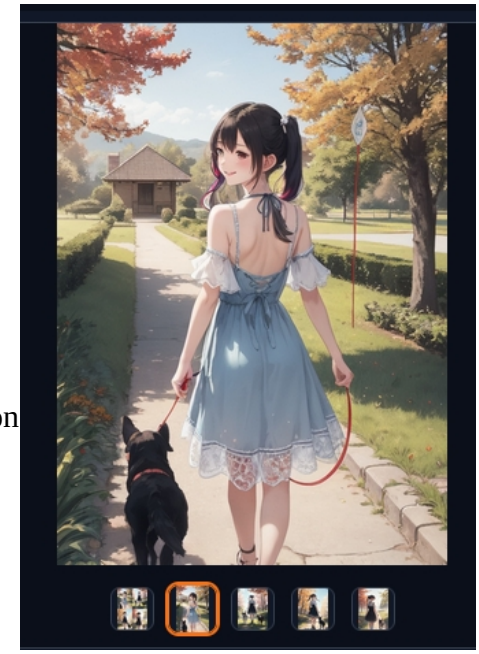
6.2 First step, settings for finding seed

What makes good image? It is compilation of several things. Seed is important part of that compilation. So first find seed that is good. I will be using settings below to find good seed for image before i start to make it higher quality. I use batch size 4 to get 4 images per generate. In the image I have seed, but setting it to -1 on this part is good idea.



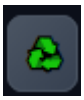
Important note: The tiled diffusion does not work if there is too few tiles. When that happens you have to either lower width tile or height tile. You can see this in the console.

```
[Tiled Diffusion] ignore tiling when there's only 1 tile :)
```

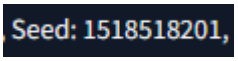


After 4 times generating 4 images I found one that looks ok. Sometimes it can take few generates.

Now that i have seed, clicking the green image next to seed drops the right seed in the settings when we have the right image selected.



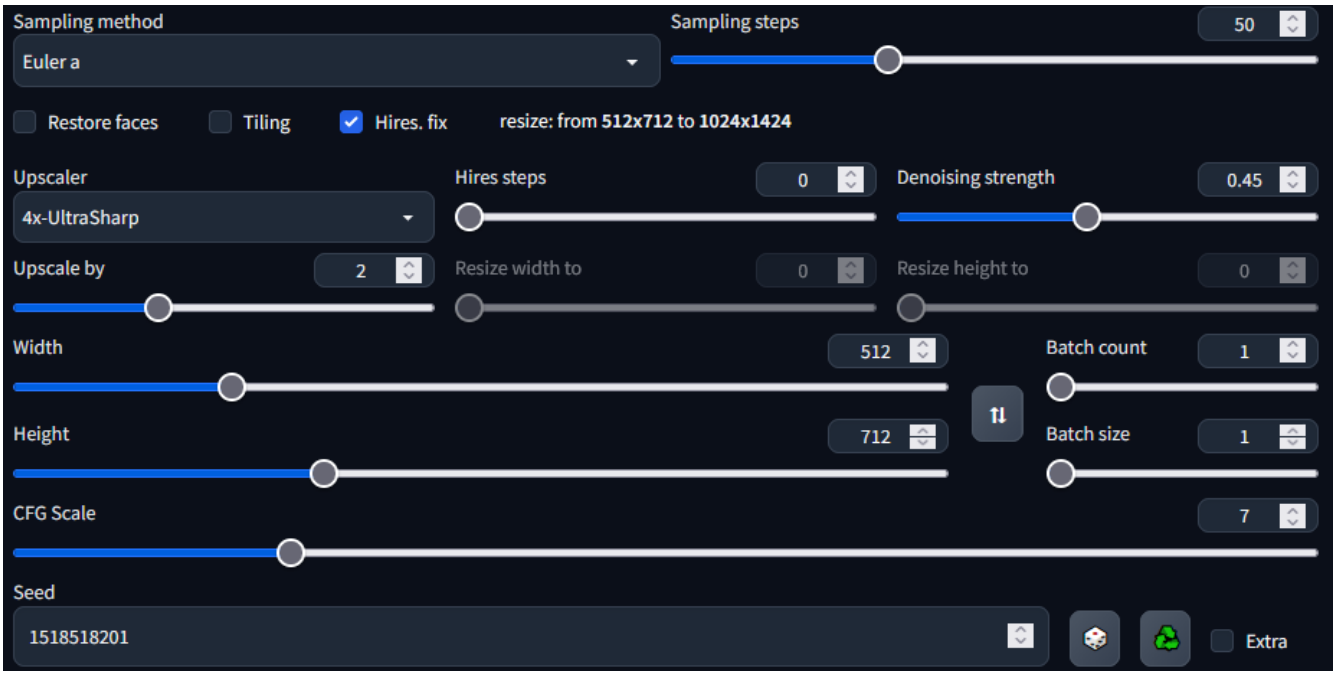
If for some reason it does not give the seed, you can see the generation data under the image, and the seed is there



Hires. Fix is not necessary to get good images with Multidiffusion. You can jump straight to IMG2IMG with no Hires. Fix and for example do 2x upscaling and experiment.;)

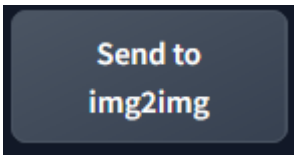
6.2 Second step, Hires generate

Now that we have seed, we can go to next step. The settings change little, not much. Remember to change batch size to 1. The tiled diffusion settings are same as in image above. Enable Hires. Fix. I am using ultrasharp upscaler, that is my personal preference. I usually use denoising strength between 0.3-0.55. Experimenting and finding what you like is good idea.



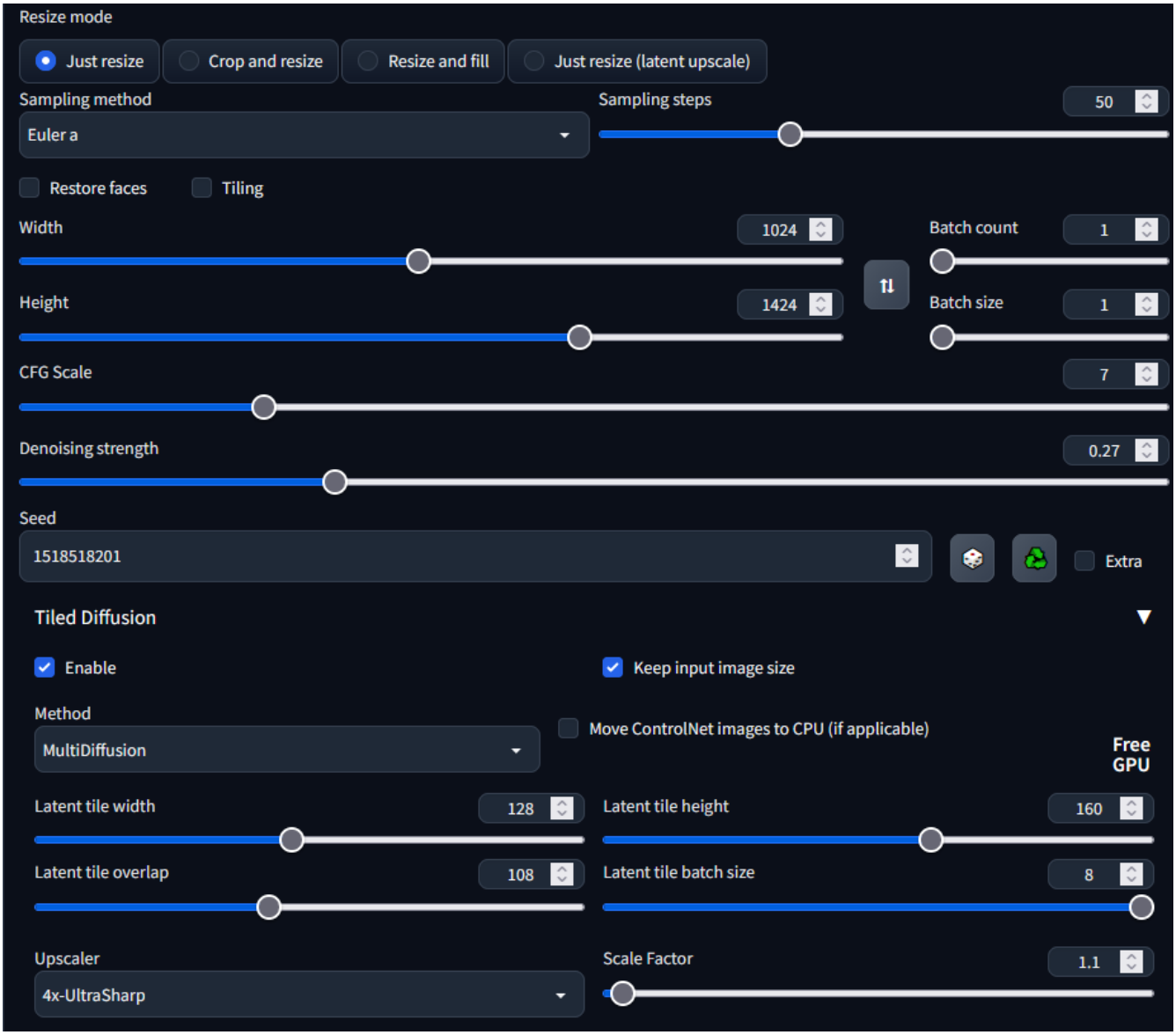
6.3 Third step IMG2IMG enhance

Now I have generated my Hires image with text2img and I will be moving it to IMG2IMG.

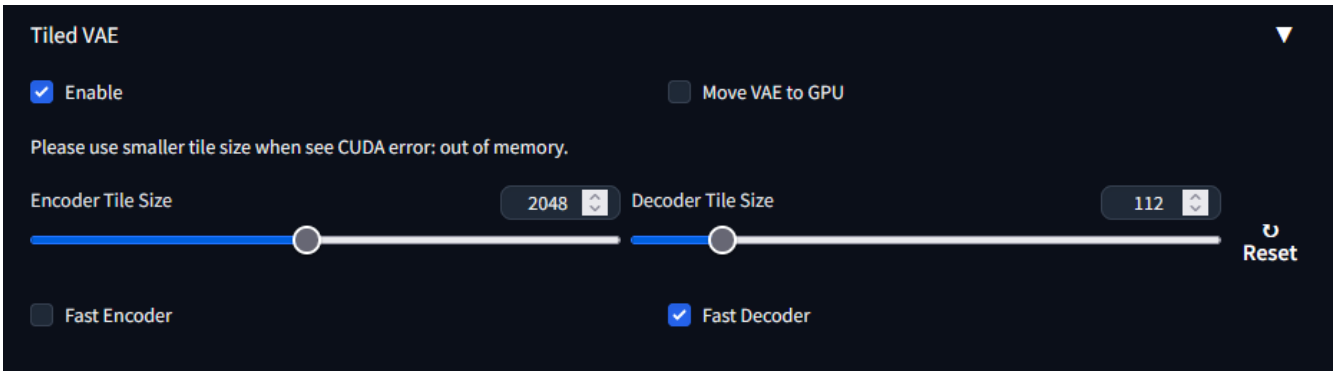


In IMG2IMG my settings look like this. Same sampler, same sampling steps, same seed, same CFG. These can all be changed for different results. Experimenting is the key. For denoising strength in IMG2IMG I will be using lower setting, something between 0.2-0.35 seem to work pretty well without messing things in the image most of the time.

Changing latent tile width and height to higher is good idea. I have scale factor set to 1.1. Higher scale factor will give more detail, I recommend testing higher scaling. You have to take scaling in to factor when deciding on the tile width/height. Too low tile width/height + tile overlap can change the image in bad way.



Remember to have tiled VAE enabled in IMG2IMG too. You might run out of VRAM without it.



Important note: The tiled diffusion does not work if there is too few tiles. When that happens you have to either lower width tile or height tile. You can see this in the console.

```
[Tiled Diffusion] ignore tiling when there's only 1 tile :)
```

6.4 Results

First generate | Hires generate | IMG2IMG enhance

Compare in imgsli before and after img2img https://imgsli.com/MTczMjkx

7 Bonus inpaint

I will be briefly showing inpainting with tiled diffusion. It can give extremely detailed results with right settings + model. Experimenting is the key to success.

The masked area will be the head.

The prompt is

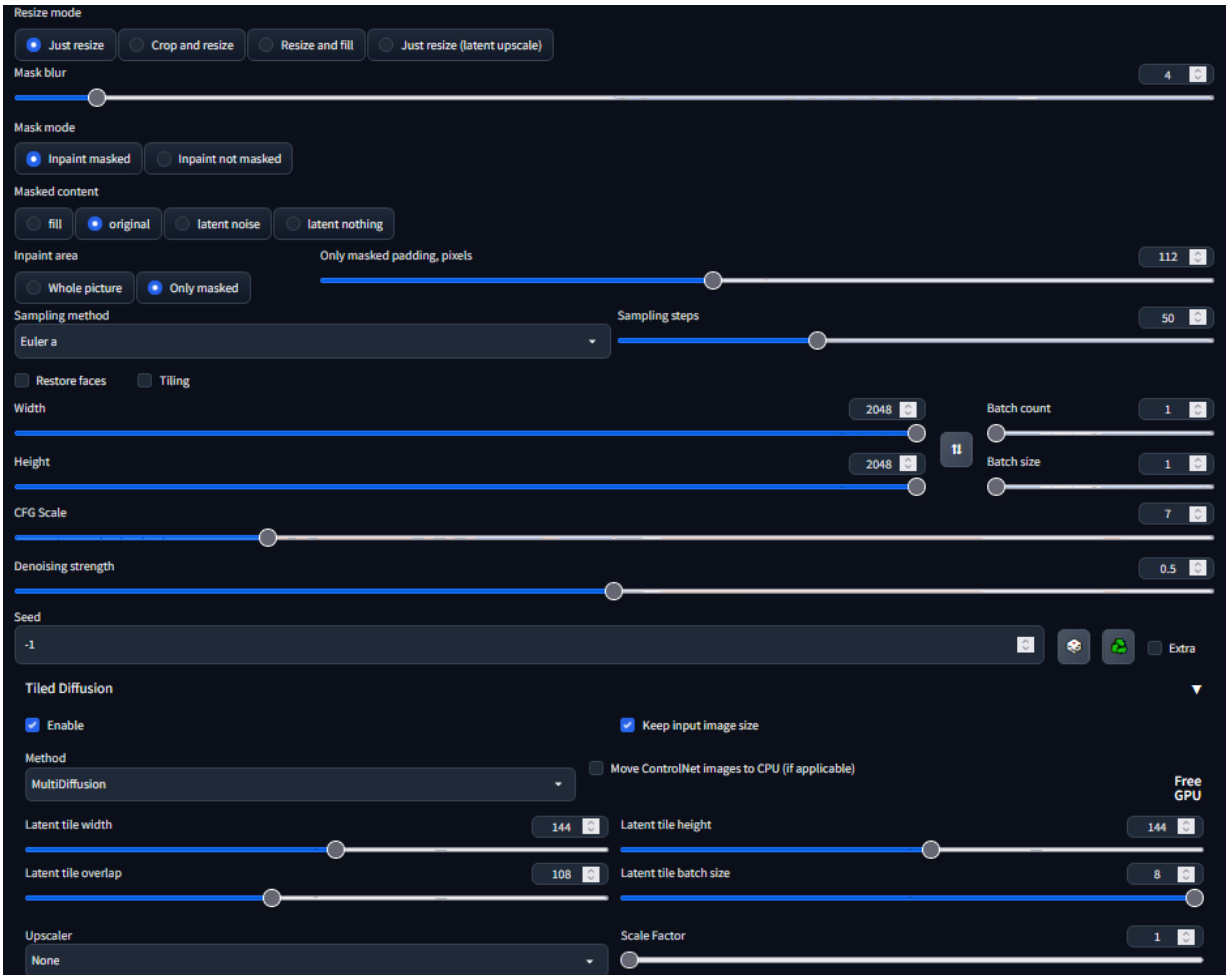
masterpiece, best quality, (grainy:0.7), intricate detail, sharp, perfect anatomy, finely detailed, bloom, noon, vivid colors

BREAK

Detailed face, blue iris, detailed eyes, detailed twintail,

Settings as follow:

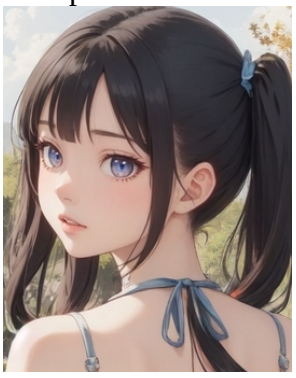
+ tiled VAE enabled



Results:

Original:

Inpainted:



8 The end

Thank you for getting this far in this tutorial. English is not my first language so forgive me for mistakes I make. You can point them out in the discussion of the tutorial in civitai website ;)
https://civitai.com/models/34726

Big thanks to pkuliyi2015 https://github.com/pkuliyi2015 for creating this extension

https://github.com/pkuliyi2015/multidiffusion-upscaler-for-automatic1111 if you like the extension, please go and give some love.

Please leave feedback and images you have generated! :)

Potatovision https://civitai.com/user/Potatovision/models