

# YOU NEED A GPU WITH 30.5 OF VRAM

~~In the future, it might be possible to reduce it to around 20gb, for updates on fp16 join the touhou ai discord~~

also consider donating so maybe i can rent one of those A100s instances :( <https://ko-fi.com/chavinlo>

## Training News:

11/09/2022:

~~Turns out Bronies had this technology all this time! They didnt even shared the code~~  
~~Supposedly its even possible on 12gb gpus... More information later today.~~  
~~somewhat fake, the only brony we know didnt used 12gb gpus rather 8 A6000~~  
~~could be another one though~~

12/09/2022:

~~Its a little bit hard to explain, but basically we have been trying multiple versions of attention.py and model.py located on the ldm folder.~~  
~~Some of these modifications you might already have, such as in the REDACTED repo.~~

~~There are multiple versions, the latest and most updated version currently is:

<https://github.com/lstein/stable-diffusion/tree/development/ldm/modules>

but rather than decreasing VRAM usage it increases it to 35.5gb.

Waifu Diffusion repo had a pr for days with a similar solution:

<https://github.com/harubaru/waifu-diffusion/pull/9>

~~If you want to keep up to date and/or get more information make sure to subscribe/check out the following sources:

<https://github.com/lstein/stable-diffusion/issues/431>

<https://discord.gg/VvuQX3a5h6> --research finetune channel

<https://discord.gg/jDHZYHburh> --everything really

<https://github.com/neonsecret/stable-diffusion>

~~On another note, I will not say names, but there are two similar users, do not confuse them. If you know you know.~~

15/09/2022:

Training on lower mem has been confirmed, not as efficient though.

Expect a colab notebook soon.

Also I will be releasing more self-trained models, datasets, and scripts on the discord.

informal training guide by dep#2171

look I will write this with no organization whats so ever beacuse thats what takes time

If you have any problems, you can always join "stable-diffusion-training-lounge" discord: <https://discord.gg/xVsyrmhQWS>

I am also writing this because currently im running a file\_ext extractor thats going to take a while so yeah I dont want to waste my time

this is pseudo windows and linux.

requirements for personal instance, can be win or linux:

anything really, just a big drive with at least 30gb free

requirements for linux instance:

at least 30gb of disk storage, 30.5gb of vram, and 11gb of ram

you need both not just one

if you can't understand something in this guide again, go to the discord cuz im not going to edit this a million times like the prior guide I did and a ton of people accused me for spreading misinformation

Im also writing this off my head beacuse paperspace just terminated me temporaly

my setup is as follows:

windows with cygterminal installed

linux with a6000 40gb of vram AND ram, 50gb of disk storage

lets start with the dataset

go down to see the dataset format

download cygwin if on windows, if on linux just install rsync

LETS SAY I want to download batches 0000-0009, do this:

```
rsync --progress rsync://176.9.41.242:873/danbooru2021/512px/000\* ./512px/
```

this will download the folders 0000 to 0009 onn 512px

now the metadata:

```
rsync --progress rsync://176.9.41.242:873/danbooru2021/metadata/posts000000000000.json ./metadata/
```

same thing but on metadata folder

now lets extract the images along with its tags.

download the extractor

```
wget https://github.com/chavinlo/waifu-diffusion/blob/patch-3/danbooru\_data/local/extractfromjson\_danboo21.py
```

flags:

--jsonpath path to json

--extractpath path to where to extract the images and text files

--rating optional, select ratings from e (explicit), g (general), q (questionable) or s (safe), only put the letter in small caps

--convtohuman ignore its broken currently

--imagespath optional, put the path to images, if none it will default to 512px

so it should be:

```
py extractfromjson_danboo21.py --jsonpath metadata/posts000000000000.json --extractpath extracted --imagespath 512px --rating s
```

why rating s? beacuse everything in the 512px folder is only rated safe anyways. explicit and rest are on original folder but for more info on that join the discord this will just explain the basics

it will output everything to the folder "extracted"

there will be txt files and jpg files both with same names

now you compress them and send it to your training (linux) instance

once there, run the following:

```
git clone https://github.com/harubaru/waifu-diffusion
cd waifu-diffusion
pip install -e .
pip install omegaconf einops pytorch-lightning==1.6.5 test-tube transformers kornia
pip install -e git+https://github.com/CompVis/taming-transformers.git@master#egg=taming-transformers
pip install -e git+https://github.com/openai/CLIP.git@main#egg=clip
pip install setuptools==59.5.0
pip install pillow==9.0.1
pip install torchmetrics==0.6.0
```

IF ANY OF THE DEPENDENCIES FAIL TO INSTALL, just install them again but without the specific versions and individually

IF YOU GET "module not found taming/clip" ERROR, just copy as follows:

download the zip from <https://github.com/CompVis/taming-transformers> (source code)

unzip, and copy the "taming" folder to the root directory of the waifu diffusion repo

same for CLIP, download zip from <https://github.com/openai/CLIP.git> , unzip, copy the folder "clip" and to root directory of repo

download your dataset.zip

```
unzip dataset.zip
cd dataset
mkdir txt
mkdir img
mv .txt txt
mv img
cd ..
mv dataset danbooru-aesthetic
```

Unless haru (waifu mantainer) confirms that the loading directory is no longer hardcoded, DO NOT CHANGE THE FOLDER NAME AT ALL. this caused me so many problems.

nano [my-train.sh](#)

add the following:

```
python3 main.py -t -n "waifu-diffusion" --resume_from_checkpoint model.ckpt --base ./configs/stable-diffusion/v1-finetune-4gpu.yaml --no-test --seed 25 --scale_lr False --gpus 0, --data_root "./danbooru-aesthetic"
```

you could try with the 1gpu yaml config, but the 4gpu works exactly the same.

Remember to add a coma next to gpu count

--resume\_from\_checkpoint does passes the model now, you can try with a nonexistent file and you will see it fails loading it

ctrl-x, save, yes same name

```
chmod +x my-train.sh
./my-train.sh
```

to resume training, just change the `--resume_from_checkpoint` path to the latest model, remember that they will be stored on the logs folder. Everytime you run the script, a new folder will be created, most of which will weight about 3gb each, so be careful with storage.

TROUBLESHOOTING HERE:

there might be a million errors more after this guide, so again, JOIN THE SERVER IF YOU HAVE QUESTIONS

ERROR 1: `KeyError: 'Trying to restore optimizer state but checkpoint contains only the model. This is probably due to ModelCheckpoint.save_weights_only being set to True.'`

FIX 1:

patch pytorch lightning as follows, credits to haru and astralite for the fix:

your terminal will most likely print a path that points to a file named "checkpoint\_connector.py" during the logtrace, copy that path

nano PATH TO checkpoint\_connector.py

search for "state\_dict" and remove everything after it and replace it for "and False:"

should be something like this, remember that it varies through versions:

<https://media.discordapp.net/attachments/979237546028597288/1016238769562734672/unknown.png>

<https://i.imgur.com/32YLzl1.png>

search for the call of "self.restore\_optimizers\_and\_schedulers()" or the definition of "restore\_training\_state"

comment out the call of "self.restore\_optimizers\_and\_schedulers()"

should be like this:

<https://media.discordapp.net/attachments/979237546028597288/1016239598202015825/unknown.png>

<https://i.imgur.com/iAGud4J.png>

ERROR 2: `FileNotFoundError: [Errno 2] No such file or directory: ''`

full traceback:

```
Traceback (most recent call last):
  File "/notebooks/waifu-diffusion/main.py", line 719, in <module>
    trainer.fit(model, data)
  File "/usr/local/lib/python3.9/dist-packages/pytorch_lightning/trainer/trainer.py", line 770, in fit
    self._call_and_handle_interrupt(
  File "/usr/local/lib/python3.9/dist-packages/pytorch_lightning/trainer/trainer.py", line 721, in _call_and_handle_interrupt
    return self.strategy.launcher.launch(trainer_fn, args, trainer=self, **kwargs)
  File "/usr/local/lib/python3.9/dist-packages/pytorch_lightning/strategies/launchers/subprocess_script.py", line 93, in launch
    return function(args, kwargs)
  File "/usr/local/lib/python3.9/dist-packages/pytorch_lightning/trainer/trainer.py", line 811, in _fit_impl
    results = self._run(model, ckpt_path=self.ckpt_path)
  File "/usr/local/lib/python3.9/dist-packages/pytorch_lightning/trainer/trainer.py", line 1236, in _run
    results = self._run_stage()
  File "/usr/local/lib/python3.9/dist-packages/pytorch_lightning/trainer/trainer.py", line 1323, in _run_stage
    return self._run_train()
  File "/usr/local/lib/python3.9/dist-packages/pytorch_lightning/trainer/trainer.py", line 1342, in _run_train
    self._pre_training_routine()
  File "/usr/local/lib/python3.9/dist-packages/pytorch_lightning/trainer/trainer.py", line 1335, in _pre_training_routine
    self._call_callback_hooks("on_pretrain_routine_start")
  File "/usr/local/lib/python3.9/dist-packages/pytorch_lightning/trainer/trainer.py", line 1636, in _call_callback_hooks
    fn(self, self.lightning_module, *args, kwargs)
  File "/notebooks/waifu-diffusion/main.py", line 260, in on_pretrain_routine_start
    os.makedirs(self.logdir, exist_ok=True)
  File "/usr/lib/python3.9/os.py", line 225, in makedirs
    mkdir(name, mode)
FileNotFoundError: [Errno 2] No such file or directory: ''
```

FIX 2: put the model on waifu-diffusion/logs/original/checkpoints/last.ckpt

waifu-diffusion being the root of the repo

CHANGE THE [my-train.sh](#) FILE TOO:

```
python3 main.py -t -n "waifu-diffusion" --resume_from_checkpoint logs/original/checkpoints/last.ckpt --base
./configs/stable-diffusion/v1-finetune-4gpu.yaml --no-test --seed 25 --scale_lr False --gpus 0, --data_root "./danbooru-
aesthetic"
```

ERROR 3: cannot find module "clip" or "taming"

FIX 3:

IF ANY OF THE DEPENDENCIES FAIL TO INSTALL, just install them again but without the specific versions and individually

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unzip, and copy the "taming" folder to the root directory of the waifu diffusion repo

same for CLIP, download zip from <https://github.com/openai/CLIP.git> , unzip, copy the folder "clip" and to root directory of repo

ERROR 4: `AttributeError: 'int' object has no attribute 'strip'`

traceback:

```
Traceback (most recent call last):
  File "C:\Users\T\waifu-diffusion\main.py", line 676, in <module>
    ngpu = len(lightning_config.trainer.gpus.strip(",").split(','))
AttributeError: 'int' object has no attribute 'strip'
```

FIX 4:

add a coma to gpu count

if one gpu:

--gpus 0,

ERROR 5: script just closes out of nowhere without output (well it prints one blank line and then it exits)

this one made me almost kill myself

FIX 5:

you are probably running [train.sh](#) which is a little bit broken, its hard to explain but heres my interaction with haru

now a similar error that I think I encountered before happens, it just exits

give me a sec I think its on the touhou disc

nope apparently not

some dead link here

haru — hoy a la 1:08

seems like it's working!

or not

dep — hoy a la 1:08

it just exited

haru — hoy a la 1:08

hm. i noticed before sometimes it executed a signal

dep — hoy a la 1:09

so something else is terminating it?

haru — hoy a la 1:09

not too sure honestly, what are the specs of the machine running it?

dep — hoy a la 1:10

A6000 45gb of ram

haru — hoy a la 1:13

you should see if it's maxing out the ram

dep — hoy a la 1:14

nop

max 10gb

haru — hoy a la 1:14

thats pretty strange

dep — hoy a la 1:15

is your instance working?

like, your version

haru — hoy a la 1:16

yeah

dep — hoy a la 1:16

do you think astraline would give me a copy of his version? like a zip file not a docker img

oh

haru — hoy a la 1:16

i just used whatever was on main

dep — hoy a la 1:16

could u send me yours

a

wait I will try with just the normal sh

do i add the -t flag?

dep — hoy a la 1:49

im going to shoot myself

nvm

haru — hoy a la 1:49

huh

haru — hoy a la 1:50

yeah

dep — hoy a la 1:50

it worked for a sec when the training folder renamed to danbooru-aesthetic

but it still exits

its working??

like im not even sure at this point

beacuse I remember doing this exact same thing

but the problem is that I don't think its training from the checkpoint, because if the argument is set to a non existent path it keeps working asusual

nvm it does

thank you so much

took a while but it works

haru — hoy a la 1:57

hm

must be an issue with the dataloader

dep — hoy a las 2:01

First, reinstalled all the dependencies from your message, then added --data\_root "./danbooru-aesthetic" and renamed my data folder to that name (it was a step that I forgot) but even so it exited, then I tried with -n "waifu-diffusion" but got a conflict with --resume parameter so changed it to --resume\_from\_checkpoint with the same path, and then boom it worked

but what I am worried about if its actually using the checkpoint/weights because I remember you said not too long ago that it didnt even passed the --resume\_from\_checkpoint flag, although I just tried with a non-existent path and it does seem to know that it doesnt exists, but maybe its just that and it doesnt uses it

haru — hoy a las 2:09

hmm, it'll say if it's resuming from a checkpoint and will give a list of trainable parameters

haru — hoy a las 2:11

yep

looks like it resumed from it

alright that should be it

my parsing got completed, over 3million images which im defo not going to use

see you all next time and updates will be either on my discord (<https://discord.gg/xVsyrmhQWS>), touhou ai discord or the official wd repo

remember join the discord for support or any questions