OpenAI's Guided Diffusion Model is conjunction with Keras VAEs

Theory Resources:

Diffusion Models Explanation(Youtube):
https://www.youtube.com/watch?v=fbLgFrlTnGU

Variational Autoencoders:
https://www.youtube.com/watch?v=fcvYpzHmhvA

GitHub Resources:

Guided Diffusion:
https://github.com/openai/guided-diffusion

Improved Diffusion:
(We are not using this model but the guided diffusion model has a similar pipeline and hence shares the README)
https://github.com/openai/improved-diffusion

Hyper-parameter Specifications:

Image Size:
An image size of 128 implies an output image of 128x128

Num Channels:
Greater the value greater the amount of detail in the image

Num Res Blocks:
Denotes the number of skip blocks, helps in training the model quicker but takes more VRAM.
Judge by the structure of model given in guided_diffusion/script_util.py (line 151-160)

Diffusion Steps:
Will determine number of diffusion steps before image becomes pure noise according to the noise schedule

Batch Size:
Self-Explanatory
Diminishing returns above 120

Microbatch:
Self-Explanatory
VRAM usage exceeds 16GB VRAM above 3 for 128x128 images

--use_fp16:
Do not use. Reduces model accuracy for lower VRAM usage. Severely hampers output quality

--noise_schedule:
https://towardsdatascience.com/beginners-guide-to-diffusion-models-8c3435ccb4ae
(linear or cosine) Linear is more robust and easier to train but Cosine can produce more varied results but require more accurate hyper-parameter tuning

--lr:
Learning Rate. A lower learning rate produces cleaner outputs but obviously takes longer to train

--lr_anneal_steps:
Till what epoch do you want to train

--save_interval:
After how many epochs do you want to regularly save weights (Each save file is 5GB for 128x128 images)

--num_samples:
How many samples do you wish to make

--timestep_respacing:
Greater value provides more detailed results