

Blender animation rendering This documentation should help you to get started with rendering Blender animation movies using the HPC cluster at TU Ilmenau.

Important hints In general, it is recommended to use the latest version of Blender, however some problems can also occur with the latest version. Version 2.92.0 should not create any problems (well tested).

In general, it is strongly recommended to at first render a very low resolution scene with 1 GPU to see if everything is configured correctly, at least a few frames. It also might be very useful for you to disable overwriting frames, hence the frames which are already rendered will be skipped and not rendered again. You can do that in the Blender GUI: Output Properties -> Output -> disable Overwrite.

Framerate Before rendering, you might check at which framerate you want to render your animation clip. It is strongly recommended to open the main .blend file (mostly something with *.lighting.blend) directly in the Blender GUI. If you want to render your animation at 60fps, simply setting your scene's framerate to 60fps is **not enough**. This would still result in your rendered animation having the default frame rate of your scene, mostly 24fps. This is because Blender works on a frame basis and doesn't have any time component included.

To adapt your scene's framerate to higher values, you have to go to „Output Properties“ -> „Time Remapping“ and adapt the „New“ value there. E.g. if you want to increase the framerate of your scene from 24fps to 60fps, which corresponds to an increase of factor 2.5, you have to adapt the „New“ value to 250 while the „Old“ stays at 100. Doing that, your scene will contain 2.5x more frames than before. Afterwards, you need to set the framerate to 60fps and adapt the frame start and frame end to the corresponding new values. To do that, just check the timeline for the new START and END frame number and enter the values accordingly. To check, if everything went fine, you can check whether you roughly have 2.5x more frames than before.

The remaining parameters (output resolution, image format etc.) you can also set via the script which is explained in the section „Python scripts“.

Noise To reduce the noise in your rendered Blender scene, you might consider to change the „Render“ parameter under „Render properties“ -> „Sampling“ to values of around 1000-2000. Be aware that if you increase the sampling value, you will need more time for processing.

Python scripts There are two Python scripts. In both, you can configure parameters, the most important one is probably the resolution. It is important to use these Python scripts when running Blender, otherwise the GPU won't be used for rendering. **Important:** the parameters given in the Python script will **override** the parameters of your .blend file.

If you want to run Blender with the HPC batch system (recommended), you should use the `enable\_gpus\_all.py` script, simply enabling every GPU available via the batch system. If you want to run Blender on an interactive GPU computing node as e.g. makalu86, it is strongly recommended to use the `enable\_gpus.py` script so that you can specify which GPU(s) you want Blender to use. Please refer to the comments in the source code to set the `devices\_to\_use` array correctly, hence the GPU(s) to use.

Multi-GPU Scalability If you think, the more GPUs you use with Blender, the faster you render your frames, you are wrong. Blender scales quite well with a tilesize of 1024 and 4 GPUs, however you should not use more than 4 GPUs in parallel. It scales best if just one GPU is used per output frame.

Using the TUIL HPC batch system To run Blender via the HPC batch system, it is very important to

set the flags ``-debug-cycles -debug-gpu -verbose -1``, otherwise the batch job will very likely fail, even though it will run on an interactive GPU node. You should make sure that Blender only uses the desired amount of CPU-threads and not more. To do so, you should not use the ``$LSB_DJOB_NUMPROC`` flag, you should rather hard code the number of used CPU threads in your batch job, so e.g. ``-t 4``.

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