



Deep learning FAQ

ArcGIS Pro 2.5 | ArcGIS Pro 2.6 | ArcGIS Pro 2.7

Version 1.1 – December 2020

What license do I need for the deep learning tools?

All deep learning [geoprocessing tools](#) and the [Label Objects for Deep Learning](#) pane require the ArcGIS Image Analyst extension. Some of the tools are also available with the ArcGIS Spatial Analyst extension. The interactive [Object Detection tool](#) for imagery in a 3D scene requires the ArcGIS Pro Advanced license.

Do I have to install all the deep learning libraries to run the deep learning tools?

Yes, you need to follow all the instructions listed in the [help documentation](#).

I have other versions of deep learning libraries installed. Will they work with the current version of ArcGIS Pro?

No, each version of ArcGIS Pro requires specific versions of libraries. You must uninstall existing packages and libraries and install the versions listed in the install instructions.

I just upgraded my ArcGIS Pro to the latest version. Do I need to reinstall the deep learning frameworks?

Yes, each version of ArcGIS Pro requires specific versions of libraries. You must install the versions that come with the Deep Learning Frameworks Installer.

What are the GPU requirements for running deep learning tools?

The recommended VRAM for running training and inferencing deep learning tools in ArcGIS Pro is 8GB. If you are only performing inferencing (detection or classification with a pre-trained model), 4GB is the minimum required VRAM, but 8GB is recommended.

I have an older GPU that is incompatible with the software, or I have low GPU memory. What are the requirements?

If you do not have the required 4-8GB VRAM, you can run the tools on the CPU, though the processing time will be longer.

How can I speed up the inferencing tools?

If you are not already using the GPU, set the **Processor Type** to **GPU** in the Environment settings of the tool. You may also try increasing the batch size for optimal GPU utilization. If the batch size is too high, you may see an error “CUDA_OUT_MEMORY”, so you will need to experiment with the batch size to find the right size for your model.

Why am I seeing “conda or jupyter notebook not recognized as internal or external command” when trying to install the libraries manually?

You may see the errors above if you are using the standard Windows command prompt instead of the ArcGIS Pro Python Command Prompt. You can access it from the Start menu by searching for “Python Command Prompt”, or you can find it in the ArcGIS Pro install location. The ArcGIS Pro Python Command Prompt allows you to access the standard tools and libraries that come with conda or jupyter.

What do I do if I see a conda broken package error, or a verification error when trying to install libraries manually?

Clean your local cache using `conda clean -t`.

After training, how do I know how well my model has performed?

The output folder for the trained model contains a file called `model_metrics.html`. This file contains information on your trained model such as the learning rate, training and validation loss, and the average precision score.

After object detection, how do I know how well my model performed?

If you have ground truth data, you can compare your model results to ground truth using the [Compute Accuracy for Object Detection](#) geoprocessing tool, available in ArcGIS Pro 2.7 with the Image Analyst license. You may also use the [Attributes](#) pane to view and verify the results of the Classify Objects Using Deep Learning tool or the Detect Objects Using Deep Learning tool.

What library versions are required for each version of ArcGIS Pro?

ArcGIS Pro 2.5	ArcGIS Pro 2.6	
tensorflow-gpu=1.14.0 keras-gpu=2.2.4 scikit-image=0.15.0 Pillow=6.1.0 fastai=1.0.54 pytorch=1.1.0 libtiff=4.0.10 torchvision=0.3.0	tensorflow-gpu=2.1.0 keras-gpu=2.3.1 scikit-image=0.17.2 pillow-simd=7.0.0 fastai=1.0.60 pytorch=1.4.0 libtiff=4.0.10 scikit-image=0.15.0 torchvision=0.5.0	
ArcGIS Pro 2.7		
absl-py=0.11.0 aiohttp=3.6.3 ase=3.19.1 astor=0.8.1 async-timeout=3.0.1 beautifulsoup4=4.9.3 cachetools=4.1.1 catalogue=1.0.0 cloudpickle=1.6.0 cudatoolkit=10.1.243 cudnn=7.6.5 cymem=2.0.4 cython=0.29.21 cython-blis=0.4.1 cytoolz=0.11.0 dask-core=2.30.0 deep-learning-essentials=2.7 fastai=1.0.60 fastprogress=0.2.3 fasttext=0.9.2 filelock=3.0.12 gast=0.2.2 google-auth=1.23.0 google-auth-oauthlib=0.4.2 google-pasta=0.2.0 googledrivedownloader=0.4 graphviz=2.38 grpcio=1.31.0 imageio=2.8.0 isodate=0.6.0 joblib=0.17.0 keepalive=0.5 keras-applications=1.0.8	keras-base=2.3.1 keras-gpu=2.3.1 keras-preprocessing=1.1.0 laspy=1.7.0 libopencv=4.5.0 libprotobuf=3.13.0.1 libwebp=1.1.0 llvmlite=0.34.0 markdown=3.3.3 multidict=4.7.6 murmurhash=1.0.2 ninja=1.10.1 numba=0.51.2 nvidia-ml-py3=7.352.0 onnx=1.7.0 onnx-tf=1.5.0 opencv=4.5.0 opt_einsum=3.1.0 plac=1.1.0 plotly=4.5.4 pooch=1.0.0 preshed=3.0.2 protobuf=3.13.0.1 py-opencv=4.5.0 pyasn1=0.4.8 pyasn1-modules=0.2.8 pytorch=1.4.0 pywavelets=1.1.1 rdflib=5.0.0 retrying=1.3.3 rsa=4.6 sacremoses=0.0.43 scikit-image=0.17.2	scikit-learn=0.23.2 sentencepiece=0.1.91 soupsieve=2.0.1 spacy=2.2.4 sparqlwrapper=1.8.5 srsly=1.0.2 tensorboard=2.3.0 tensorboard-plugin-wit=1.6.0 tensorboardx=2.1 tensorflow=2.1.0 tensorflow-addons=0.9.1 tensorflow-base=2.1.0 tensorflow-estimator=2.1.0 tensorflow-gpu=2.1.0 termcolor=1.1.0 thinc=7.4.0 threadpoolctl=2.1.0 tiffio=2020.10.1 tokenizers=0.8.1 toolz=0.11.1 torch-cluster=1.5.4 torch-geometric=1.5.0 torch-scatter=2.0.4 torch-sparse=0.6.1 torch-spline-conv=1.2.0 torchvision=0.5.0 tqdm=4.51.0 transformers=3.3.0 typeguard=2.7.0 wasabi=0.6.0 werkzeug=0.16.1 yarl=1.6.2