# Deep Learning installation

# Table of Contents

# Install deep learning frameworks for ArcGIS

📒 **Note:** February 10, 2020

These instructions apply to ArcGIS Pro 2.5.

Instructions to install deep learning frameworks for ArcGIS Enterprise apply to the 10.8 release.

To work with the deep learning tools in ArcGIS Pro, you need to install supported deep learning frameworks. If you will be working exclusively with the CPU and you are using TensorFlow, skip to the section Run TensorFlow on the CPU

To install deep learning packages in ArcGIS Pro, first ensure that ArcGIS Pro is installed.

Using the steps below, you will create a new Python deep learning environment by cloning the default Python environment `arcgispro-py3`. While you can use any unique name for your cloned environment, the steps below use `deeplearning`.

Next, you will install the following Python packages: Tensorflow, fast.ai, Keras, Pytorch, Scikit-image, Pillow, and Libtiff. Keep in mind you will be installing specific versions of these packages indicated in the installation steps below. The tools only work with these specific versions. Once the packages are installed, you can swap the ArcGIS Pro environment and use the tools.

📒 **Note:** The deep learning packages cannot be installed using the Python Package Manager.

You need to install the packages through the command prompt.

It is best practice to install all the packages listed below in order to run all the deep learning tools.

Follow these steps to set up your machine to use the deep learning tools:

1. Open the **Python Command Prompt** window.

2. Type the following commands:

   a. `conda create --name deeplearning --clone arcgispro-py3`

   b. `activate deeplearning`

   c. `conda install tensorflow-gpu=1.14.0`

   d. `conda install keras-gpu=2.2.4`

   e. `conda install scikit-image=0.15.0`

   f. `conda install Pillow=6.1.0`

   g. `conda install fastai=1.0.54`

   h. `conda install pytorch=1.1.0`

   i. `conda install libtiff=4.0.10 --no-deps`

   j. `proswap deeplearning`

You can now use all the deep learning tools.

> 📒 **Note:** It is best practice to create a new Python environment if you upgrade your version of ArcGIS Pro. For example, if you upgrade from ArcGIS Pro 2.4 to ArcGIS Pro 2.5, start fresh with a new `deeplearning` Python environment.

## Run TensorFlow on the CPU

You can install TensorFlow to run on your computer's CPU.

1. Create a new Python environment by cloning an existing environment. For information on how to create and clone Python environments and install Python packages, see Python Package Manager.

2. Once the environment has been created, activate it by clicking the option next to the environment, and click **OK**.

3. Click the **Add Packages** button, search for tensorflow-mkl , and install the most recent version of the package.

Learn about installing deep learning on ArcGIS Enterprise.