# ***How to create the environment for the Dynamic Background Remover***

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# Installation without the training code:

If you want to use the machine learning models that I’ve provided and remove backgrounds from videos, the installation is quite simple. All you need to do is install a few common libraries:

pip install torch torchvision

pip install opencv-python

pip install wxpython

pip install tqdm

That’s it.

If you are feeling more adventurous, continue on to the next section and install the components required to train new models on your local computer.

As an alternative to the following section, you may use the Jupyter notebook I have provided and run the training in Google Colaboratory. Because I develop on Apple Silicon and it’s not yet fully supported in pytorch, I tend to use Google Colab for most of my model training. For my limited use, the cost of premium GPUs is worth the time it saves me.

# Installing with the training code:

Installing all of the software packages required by the trainer is a much more involved process and is platform dependent. The reason for this dependency is primarily due to the requirement to install Meta’s Detectron2 in your system. I have provided setup instructions for the 3 most common platforms below. Depending on your exact system configuration, there may be additional steps required. For instance, the MS Windows install may require installing the appropriate CUDA software prior to the steps below if you have NVidia GPUs in your system.

## Environment Setup on MacOS on Intel:

This installs everything you need for the trainer and animation/contour image creation.

Create a python 3.10 environment

pip install –upgrade pip

pip install –upgrade setuptools

pip install torch torchvision

pip install opencv-contrib-python

# this version of detectron2 is a specific commit before an export bug was recently introduced

pip install git+https://github.com/facebookresearch/detectron2.git@5aeb252b194b93dc2879b4ac34bc51a31b5aee13

# in numpy 1.24.0 a capability was removed that detectron2 needs. Install the last version

# before they removed it.

pip install numpy==1.23.1

pip install wxpython

## Environment Setup on MS Windows 10:

Note: I don’t have access to a MS Windows 11 machine so I can not verify that these same instructions work. However, I would expect them to work in that environment as well.

This installs everything you need for the trainer and animation/contour image creation.

1. Create a python 3.10 environment
2. Install Microsoft Visual C++ 14.0 or greater. Get it with "Microsoft C++ Build Tools": https://visualstudio.microsoft.com/visual-cpp-build-tools/

Note: this location explains which modules to select if you are having issues after install:

<https://stackoverflow.com/questions/29846087/error-microsoft-visual-c-14-0-is-required-unable-to-find-vcvarsall-bat/55575792#55575792>

You can always go back and “modify” the install to select the correct components if you didn’t do it during the initial installation.

1. Install git: <https://git-scm.com/download/win>

Note: make sure that git is in the system PATH

1. Install components within your python environment:

python.exe -m pip install –upgrade pip

python.exe -m pip install –upgrade setuptools

python.exe -m pip install torch torchvision

python.exe -m pip install opencv-contrib-python

# this version of detectron2 is a specific commit before an export bug was recently introduced

python.exe -m pip install git+<https://github.com/facebookresearch/detectron2.git@5aeb252b194b93dc2879b4ac34bc51a31b5aee13>

# in numpy 1.24.0 a capability was removed that detectron2 needs. Install the last version

# before they removed it.

python.exe -m pip install numpy==1.23.1

python.exe -m pip install wxpython

Note: There are a few different tutorials on installing Detectron2 in Windows environments. Here are two that are pretty good if you are looking for a more detailed explanation.

<https://haroonshakeel.medium.com/detectron2-setup-on-windows-10-and-linux-407e5382df1>

<https://medium.com/@yogeshkumarpilli/how-to-install-detectron2-on-windows-10-or-11-2021-aug-with-the-latest-build-v0-5-c7333909676f>

## Environment Setup on Apple Silicon Computer:

This installs everything you need for the trainer and animation/contour image creation.

Create a python 3.10 environment

pip install –upgrade pip

pip install –upgrade setuptools

pip install torch torchvision

pip install opencv-contrib-python

# this version of detectron2 is a specific commit before an export bug was recently introduced

pip install git+https://github.com/facebookresearch/detectron2.git@5aeb252b194b93dc2879b4ac34bc51a31b5aee13

# the version of pycocotools that gets installed is not compatible with Apple Silicon so you have

# to uninstall it and install the correct version. Not sure what happens on non Apple Silicon.

# You should probably figure out a way to test that.

pip uninstall pycocotools

# update pycocotools with a compatible version.

pip install "git+https://github.com/ppwwyyxx/cocoapi.git#egg=pycocotools&subdirectory=PythonAPI"

# in numpy 1.24.0 a capability was removed that detectron2 needs. Install the last version

# before they removed it.

pip install numpy==1.23.1

pip install wxpython

# **Misc Other Things:**

1. If while trying to train a model you get an error that looks something like this:

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Failed to download https://dl.fbaipublicfiles.com/detectron2/COCO-InstanceSegmentation/mask\_rcnn\_R\_50\_FPN\_3x/137849600/model\_final\_f10217.pkl

Traceback (most recent call last):

File "/Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/urllib/request.py", line 1348, in do\_open

h.request(req.get\_method(), req.selector, req.data, headers,

File "/Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/http/client.py", line 1

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It means that your security certificates didn’t get installed properly while installing Python. Using the MacOS “Finder”, navigate to /Applications/Python 3.10/ and then double click on “Install Certificates.command” It will open a terminal window and fix your certificates.