

How to modify MLAgents to export the model to Pytorch rather than Onnx

Start by going to the path where you have your Anaconda installed.

Once there, go to your "envs" folder

This PC > 1TB HD (D:) > Anaconda_Installation

Name	Date modified	Type	Size
bin	12/14/2020 1:42 AM	File folder	
condabin	12/14/2020 1:43 AM	File folder	
conda-meta	1/6/2021 2:18 PM	File folder	
DLLs	12/14/2020 10:30 AM	File folder	
envs	1/18/2021 4:10 PM	File folder	
etc	12/14/2020 1:43 AM	File folder	
include	12/14/2020 1:43 AM	File folder	
info	12/14/2020 1:43 AM	File folder	
Lib	12/14/2020 1:43 AM	File folder	
Library	1/6/2021 2:18 PM	File folder	
libs	12/14/2020 1:43 AM	File folder	
man	12/14/2020 1:43 AM	File folder	
Menu	12/14/2020 1:43 AM	File folder	
pkgs	1/18/2021 4:10 PM	File folder	
Scripts	12/15/2020 12:27 PM	File folder	
share	12/14/2020 1:43 AM	File folder	
shell	12/14/2020 1:43 AM	File folder	
sip	12/14/2020 1:43 AM	File folder	
tcl	12/14/2020 1:43 AM	File folder	
Tools	12/14/2020 1:43 AM	File folder	
.nonadmin	1/6/2021 2:18 PM	NONADMIN File	0 KB
_conda	11/13/2020 8:51 PM	Application	18,858 KB
api-ms-win-core-console-l1-1-0.dll	4/20/2018 11:28 PM	Application exten...	19 KB
api-ms-win-core-datetime-l1-1-0.dll	4/20/2018 11:28 PM	Application exten...	19 KB
api-ms-win-core-debug-l1-1-0.dll	4/20/2018 11:28 PM	Application exten...	19 KB
api-ms-win-core-errorhandling-l1-1-0.dll	4/20/2018 11:28 PM	Application exten...	19 KB
api-ms-win-core-file-l1-1-0.dll	4/20/2018 11:29 PM	Application exten...	22 KB
api-ms-win-core-file-l1-2-0.dll	4/20/2018 11:37 PM	Application exten...	19 KB
api-ms-win-core-file-l2-1-0.dll	4/20/2018 11:37 PM	Application exten...	19 KB
api-ms-win-core-handle-l1-1-0.dll	4/20/2018 11:37 PM	Application exten...	19 KB
api-ms-win-core-heap-l1-1-0.dll	4/20/2018 11:37 PM	Application exten...	19 KB
api-ms-win-core-interlocked-l1-1-0.dll	4/20/2018 11:37 PM	Application exten...	19 KB
api-ms-win-core-libraryloader-l1-1-0.dll	4/20/2018 11:37 PM	Application exten...	20 KB
api-ms-win-core-localization-l1-2-0.dll	4/20/2018 11:37 PM	Application exten...	21 KB
api-ms-win-core-memory-l1-1-0.dll	4/20/2018 11:37 PM	Application exten...	19 KB
api-ms-win-core-namedpipe-l1-1-0.dll	4/20/2018 11:37 PM	Application exten...	19 KB
api-ms-win-core-processenvironment-l1...	4/20/2018 11:37 PM	Application exten...	20 KB
api-ms-win-core-processthreads-l1-1-0.dll	4/20/2018 11:37 PM	Application exten...	21 KB
api-ms-win-core-processthreads-l1-1-1.dll	4/20/2018 11:37 PM	Application exten...	19 KB
api-ms-win-core-profile-l1-1-0.dll	4/20/2018 11:37 PM	Application exten...	18 KB
api-ms-win-core-rtlsupport-l1-1-0.dll	4/20/2018 11:37 PM	Application exten...	19 KB

Here is the list of your installed environments. Go to the folder of the environment where you have mlagents installed

This PC > 1TB HD (D:) > Anaconda_Installation > envs

Name	Date modified	Type
GYM	12/16/2020 10:44 PM	File folder
GYM_GPU	12/17/2020 11:19 AM	File folder
Gym2	12/16/2020 11:06 PM	File folder
GYM3	12/16/2020 11:20 PM	File folder
PyTORCH_2_TFLITE	12/29/2020 11:53 AM	File folder
Tensorflow115	12/16/2020 10:14 PM	File folder

Then go to "Lib" folder

This PC > 1TB HD (D:) > Anaconda_Installation > envs > GYM

Name	Date modified	Type	Size
conda-meta	12/16/2020 10:44 PM	File folder	
DLLs	12/16/2020 10:34 PM	File folder	
include	12/16/2020 10:34 PM	File folder	
Lib	12/16/2020 10:34 PM	File folder	
Library	12/16/2020 10:44 PM	File folder	
libs	12/16/2020 10:34 PM	File folder	
Menu	12/16/2020 10:44 PM	File folder	
Scripts	12/16/2020 10:50 PM	File folder	
share	12/16/2020 10:44 PM	File folder	
tcl	12/16/2020 10:34 PM	File folder	
Tools	12/16/2020 10:34 PM	File folder	
.nonadmin	12/16/2020 10:44 PM	NONADMIN File	0 KB
api-ms-win-core-console-l1-1-0.dll	4/20/2018 1:28 PM	Application exten...	19 KB
api-ms-win-core-datetime-l1-1-0.dll	4/20/2018 1:28 PM	Application exten...	19 KB
api-ms-win-core-debug-l1-1-0.dll	4/20/2018 1:28 PM	Application exten...	19 KB
api-ms-win-core-errorhandling-l1-1-0.dll	4/20/2018 1:28 PM	Application exten...	19 KB
api-ms-win-core-file-l1-1-0.dll	4/20/2018 1:29 PM	Application exten...	22 KB
api-ms-win-core-file-l1-2-0.dll	4/20/2018 1:37 PM	Application exten...	19 KB
api-ms-win-core-file-l2-1-0.dll	4/20/2018 1:37 PM	Application exten...	19 KB

Then go to "site-packages". This is where all the libraries you installed using pip are located

This PC > 1TB HD (D:) > Anaconda_Installation > envs > GYM > Lib

Name	Date modified	Type	Size
__pycache__	12/16/2020 10:34 PM	File folder	
asyncio	12/16/2020 10:34 PM	File folder	
collections	12/16/2020 10:34 PM	File folder	
concurrent	12/16/2020 10:34 PM	File folder	
ctypes	12/16/2020 10:34 PM	File folder	
curses	12/16/2020 10:34 PM	File folder	
dbm	12/16/2020 10:34 PM	File folder	
distutils	12/16/2020 10:34 PM	File folder	
email	12/16/2020 10:34 PM	File folder	
encodings	12/16/2020 10:34 PM	File folder	
ensurepip	12/16/2020 10:34 PM	File folder	
html	12/16/2020 10:34 PM	File folder	
http	12/16/2020 10:34 PM	File folder	
idlelib	12/16/2020 10:34 PM	File folder	
importlib	12/16/2020 10:34 PM	File folder	
json	12/16/2020 10:34 PM	File folder	
lib2to3	12/16/2020 10:34 PM	File folder	
logging	12/16/2020 10:34 PM	File folder	
msilib	12/16/2020 10:34 PM	File folder	
multiprocessing	12/16/2020 10:34 PM	File folder	
pydoc_data	12/16/2020 10:34 PM	File folder	
site-packages	12/16/2020 10:59 PM	File folder	
sqlite3	12/16/2020 10:34 PM	File folder	
test	12/16/2020 10:34 PM	File folder	
tkinter	12/16/2020 10:34 PM	File folder	
turtledemo	12/16/2020 10:34 PM	File folder	
unittest	12/16/2020 10:34 PM	File folder	
urllib	12/16/2020 10:34 PM	File folder	
venv	12/16/2020 10:34 PM	File folder	
wsgiref	12/16/2020 10:34 PM	File folder	
xml	12/16/2020 10:34 PM	File folder	
xmlrpc	12/16/2020 10:34 PM	File folder	
__future__	8/15/2020 1:20 PM	Python File	5 KB
__phello__.foo	8/15/2020 1:20 PM	Python File	1 KB
_bootlocale	8/15/2020 1:20 PM	Python File	2 KB
collections abc	8/15/2020 1:20 PM	Python File	26 KB

Here you should find mlagents. If you don't, you're in the wrong environment!

This PC > 1TB HD (D:) > Anaconda_Installation > envs > GYM > Lib > site-packages

Name	Date modified	Type	Size
jupyterlab_pygments-0.1.2.dist-info	12/16/2020 10:44 PM	File folder	
keras_preprocessing	12/16/2020 10:44 PM	File folder	
Keras_Preprocessing-1.1.2.dist-info	12/16/2020 10:44 PM	File folder	
kiwisolver-1.3.1.dist-info	12/16/2020 10:40 PM	File folder	
libfuturize	12/16/2020 10:40 PM	File folder	
libpasteurize	12/16/2020 10:40 PM	File folder	
markdown	12/16/2020 10:40 PM	File folder	
Markdown-3.3.3.dist-info	12/16/2020 10:40 PM	File folder	
markupsafe	12/16/2020 10:44 PM	File folder	
MarkupSafe-1.1.1.dist-info	12/16/2020 10:44 PM	File folder	
matplotlib	12/16/2020 10:40 PM	File folder	
matplotlib-3.3.3.dist-info	12/16/2020 10:40 PM	File folder	
mistune-0.8.4.dist-info	12/16/2020 10:44 PM	File folder	
mlagents	12/16/2020 10:50 PM	File folder	
mlagents-0.18.0.dist-info	12/16/2020 10:50 PM	File folder	
mpi4py	12/16/2020 10:59 PM	File folder	
mpi4py-3.0.3.dist-info	12/16/2020 10:59 PM	File folder	
mpl_toolkits	12/16/2020 10:40 PM	File folder	

Now go to the following path (/mlagents/trainers/torch) and open the model_serialization.py file in a text editor

1TB HD (D:) > Anaconda_Installation > envs > GYM > Lib > site-packages > mlagents > trainers > torch

Name	Date modified	Type	Size
__pycache__	1/18/2021 4:22 PM	File folder	
components	1/18/2021 4:22 PM	File folder	
__init__.py	1/18/2021 4:22 PM	Python File	0 KB
decoders	1/18/2021 4:22 PM	Python File	1 KB
distributions	1/18/2021 4:22 PM	Python File	8 KB
encoders	1/18/2021 4:22 PM	Python File	10 KB
layers	1/18/2021 4:22 PM	Python File	7 KB
model_serialization.py	1/18/2021 4:22 PM	Python File	4 KB
networks	1/18/2021 4:22 PM	Python File	19 KB
utils	1/18/2021 4:22 PM	Python File	14 KB

Add the highlighted line in the method "def export_policy_model..."

```
model_serialization.py - D:\Anaconda_Installation\envs\GYM\Lib\site-packages\mlagents\trainers\torch\model_serialization.py (3.8.6)
File Edit Format Run Options Window Help

    ["vector_observation"]
    + [f"visual_observation_{i}" for i in range(self.policy.vis_obs_size)]
    + ["action_masks", "memories"]
)

self.output_names = [
    "action",
    "version_number",
    "memory_size",
    "is_continuous_control",
    "action_output_shape",
]

self.dynamic_axes = {name: {0: "batch"} for name in self.input_names}
self.dynamic_axes.update({"action": {0: "batch"}})

def export_policy_model(self, output_filepath: str) -> None:
    """
    Exports a Torch model for a Policy to .onnx format for Unity embedding.

    :param output_filepath: file path to output the model (without file suffix)
    """
    onnx_output_path = f"{output_filepath}.onnx"
    logger.info(f"Converting to {onnx_output_path}")

    # Insert Here!
    torch.save(self.policy.actor_critic, f"{output_filepath}.pth")

    with exporting_to_onnx():
        torch.onnx.export(
            self.policy.actor_critic,
            self.dummy_input,
            onnx_output_path,
            opset_version=SerializationSettings.onnx_opset,
            input_names=self.input_names,
            output_names=self.output_names,
            dynamic_axes=self.dynamic_axes,
        )
    logger.info(f"Exported {onnx_output_path}")
```

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Don't forget to save! Now, in the same path where mlagents saves the onnx file it will also save your pytorch model!