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Chapter 1. Overview

PyTorch on Jetson Platform

[PyTorch](#) (for JetPack) is an optimized tensor library for deep learning, using GPUs and CPUs. Automatic differentiation is done with a tape-based system at both a functional and neural network layer level. This functionality brings a high level of flexibility, speed as a deep learning framework, and provides accelerated NumPy-like functionality. These NVIDIA-provided redistributables are Python pip wheel installers for PyTorch, with GPU-acceleration and support for cuDNN. The packages are intended to be installed on top of the specified version of JetPack as in the provided documentation.

Jetson AGX Xavier

The NVIDIA Jetson AGX Xavier developer kit for Jetson platform is the world's first AI computer for autonomous machines. The Jetson AGX Xavier delivers the performance of a GPU workstation in an embedded module under 30W.

Jetson AGX Orin

The NVIDIA Jetson AGX Orin Developer Kit includes a high-performance, power-efficient Jetson AGX Orin module, and can emulate the other Jetson modules. You now have up to 275 TOPS and 8X the performance of NVIDIA Jetson AGX Xavier in the same compact form-factor for developing advanced robots and other autonomous machine products.

Jetson Xavier NX

The NVIDIA Jetson Xavier NX brings supercomputer performance to the edge in a small form factor system-on-module. Up to 21 TOPS of accelerated computing delivers the horsepower to run modern neural networks in parallel and process data from multiple high-resolution sensors — a requirement for full AI systems.

1.1. Benefits of PyTorch for Jetson Platform

provides you with the access to the latest version of the framework on a lightweight, mobile platform.

Chapter 2. Prerequisites and Installation

Before you install PyTorch for Jetson, ensure

you: 1. Install [JetPack](#) on your Jetson device.

2. Install system packages required by PyTorch:

```
sudo apt-get -y update;
sudo apt-get -y install autoconf bc build-essential g++-8 gcc-8 clang-8 lld-8 gettext-
base gfortran-8 iputils-ping libbz2-dev libc++-dev libcgall-dev libffi-dev libfreetype6-
dev libhdf5-dev libjpeg-dev liblzma-dev libncurses5-dev libncursesw5-dev libpng-dev
libreadline-dev libssl-dev libsqlite3-dev libxml2-dev libxslt-dev locales moreutils
openssl python-openssl rsync scons python3-pip libopenblas-dev;
```

Next, install PyTorch with the following

steps: 1. Export with the following

```
export TORCH_INSTALL=https://developer.download.nvidia.cn/compute/redist/jp/v51/pytorch/
torch-1.14.0a0+44dac51c.nv23.01-cp38-cp38-linux_aarch64.whl
```

Or, download the wheel file and set.

```
export TORCH_INSTALL=path/to/torch-1.14.0a0+44dac51c.nv23.01-cp38-cp38-linux_aarch64.whl
```

2. Install PyTorch.

```
python3 -m pip install --upgrade pip; python3 -m pip install aiohttp numpy==1.19.4
scipy==1.5.3 export "LD_LIBRARY_PATH=/usr/lib/llvm-8/lib:$LD_LIBRARY_PATH"; python3 -m
pip install --upgrade protobuf; python3 -m pip install --no-cache $TORCH_INSTALL
```

If you want to install a specific version of PyTorch, replace `TORCH_INSTALL` with:

```
https://developer.download.nvidia.com/compute/redist/jp/v$JP_VERSION/pytorch
/ $PYT_VERSION
```

Where:

JP_VERSION

The major and minor version of JetPack you are using, such as 461 for JetPack 4.6.1 or 50 for JetPack 5.0.

PYT_VERSION

The released version of the PyTorch wheels, as given in the [Compatibility Matrix](#).

2.1. Installing Multiple PyTorch Versions

If you want to have multiple versions of PyTorch available at the same time, this can be accomplished using virtual environments. See below.

Set up the Virtual Environment

First, install the `virtualenv` package and create a new Python 3 virtual environment:

```
$ sudo apt-get install virtualenv
$ python3 -m virtualenv -p python3 <chosen_venv_name>
```

Activate the Virtual Environment

Next, activate the virtual environment:

```
$ source <chosen_venv_name>/bin/activate
```

Install the desired version of PyTorch:

```
pip3 install --no-cache https://developer.download.nvidia.com/compute/redist/jp/v50/pytorch/
<torch_version_desired>
```

Deactivate the Virtual Environment

Finally, deactivate the virtual environment:

```
$ deactivate
```

Run a Specific Version of PyTorch

After the virtual environment has been set up, simply activate it to have access to the specific version of PyTorch. Make sure to deactivate the environment after use:

```
$ source <chosen_venv_name>/bin/activate
$ the desired PyTorch scripts
$ deactivate
```

2.2. Upgrading PyTorch

To upgrade to a more recent release of PyTorch, if one is available, uninstall the current PyTorch version and refer to [Prerequisites and Installation](#) to install the new desired release.

Chapter 3. Verifying The Installation

About this task

To verify that PyTorch has been successfully installed on the Jetson platform, you'll need to launch a Python prompt and import PyTorch.

Procedure

1.From the terminal, run:

```
$ export LD_LIBRARY_PATH=/usr/lib/llvm-8/lib:$LD_LIBRARY_PATH  
$ python3
```

2.Import PyTorch:

```
>>> import torch
```

If PyTorch was installed correctly, this command should execute without error.

Chapter 4. Uninstalling

PyTorch can easily be uninstalled using the `pip3 uninstall` command, as below:

```
$ sudo pip3 uninstall -y torch
```

Chapter 5. Troubleshooting

Join the [NVIDIA Jetson and Embedded Systems community](#) to discuss Jetson platform- specific issues.

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