

# HW 6 Environment Set-up

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## 1. Prerequisites

Get familiar with step 1&2 and do step 3&4.

1. PACE Instructional Cluster Environment COC-ICE:  
[https://docs.pace.gatech.edu/ice\\_cluster/ice/](https://docs.pace.gatech.edu/ice_cluster/ice/)
2. Storage on ICE: [https://gatech.service-now.com/technology?id=kb\\_article\\_view&sysparm\\_article=KB0042094](https://gatech.service-now.com/technology?id=kb_article_view&sysparm_article=KB0042094)
3. Download VPN client for your OS: [https://gatech.service-now.com/home?id=kb\\_article\\_view&sysparm\\_article=KB0042139](https://gatech.service-now.com/home?id=kb_article_view&sysparm_article=KB0042139) (first to enter [vpn.gatech.edu](https://vpn.gatech.edu), then use your GT username and password to login.)
4. Login to the ICE cluster
  - a. (ICE On Demand): [https://gatech.service-now.com/home?id=kb\\_article\\_view&sysparm\\_article=KB0042133](https://gatech.service-now.com/home?id=kb_article_view&sysparm_article=KB0042133) (click the "ICE OnDemand", a new Dashboard window will pop out.). "Files→ Home Directory", it will show all your folders/files in your home directory. Click "Clusters→\_ICE Shell Access" to open the shell, before opening HW6, we need to do environment set-up and install necessary ML libraries. (Prefer this option in your HW6.)
  - b. Alternatively, via ssh, use `ssh someuser3@login-ice.pace.gatech.edu` , replace `someuser3` with your GT username.

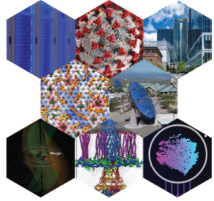
## 2. Open Jupyter Notebook and Run Your HW6

1. If you log in to ICE OnDemand successfully, then you should be able to see this interface: [Dashboard - PACE ICE OnDemand \(gatech.edu\)](#)

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If you require assistance with this system, please contact your course instructor or teaching assistant (TA).



Welcome to the PACE Instructional cluster

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- Click RHEL 9 Interactive Apps → Jupyter (RHEL 9), this is exclusively for the interactive App job creation on H100 nodes and you should be able to see this interface (~visualization to submit a slurm job). Under Anaconda Module, just choose "Pillow 10.2.0 + scikit-learn 1.4.0 + PyTorch 2.1.0" and thanks to Yongnuo Yang([yyang879@gatech.edu](mailto:yayang879@gatech.edu)), it is all you need to implement your HW6 for this course! Choose Node Type as NVIDIA GPU H100 HGX, then launch.

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Home / My Interactive Sessions / Jupyter (RHEL 9)

**IDEs**

VSCode IDE/Editor

**Interactive Apps**

Compute Node Jobs

Jupyter

MATLAB

RStudio

**Jupyter (RHEL 9) version: 2af134b**

This app will launch a Jupyter Notebook server on one or more nodes.

Anaconda Module

Pillow 10.2.0 + scikit-learn 1.4.0 + PyTorch 2.1.0

Jupyter Interface

Jupyter Notebook

Quality of Service

Default (none)

Interactive Shell

Desktops

Interactive Desktop

RHEL 9 Interactive Apps

Compute Node Jobs

Jupyter (RHEL 9)

Node Type  
NVIDIA GPU H100 HGX

Nodes  
2

Cores Per Node  
2

Number of cores (CPUs) per node

GPUs Per Node  
2

Memory Per Core (GB)

Leave blank if unsure.

Number of hours  
3

- You will see your job is whether queued, starting and running. If it is running, then you can click "Connect to Jupyter" to redirect to the jupyter notebook. Put your hw6 file under the "scratch" folder.

Home / My Interactive Sessions

IDEs

VSCode IDE/Editor

Interactive Apps

Compute Node Jobs

Jupyter

MATLAB

RStudio

Interactive Shell

Jupyter (RHEL 9) (553244)

2 nodes | 4 cores | Running

Host: >atl1-1-03-010-10-0.pace.gatech.edu
Delete

Created at: 2024-03-20 04:10:08 EDT

Time Remaining: 2 hours and 59 minutes

Session ID: 1259a7af-dc60-4eaa-985d-35ee5075739f

Connect to Jupyter

For HW6, you are all set! If you want to dive deeper about PACE-ICE, Anaconda, conda environment, you can refer below for some commands you may need to

build your own environment.

### 3. Module Load Anaconda

1. First, you can check on the current python version:

```
[xchen920@login-ice-1 ~]$ python -V
Python 2.7.5 # right
```

If your python version is already python3.8 or python3.9, you are good. If not, follow step 2-3 below to upgrade your python.

2. You CANNOT directly install conda in your home directory which has a relatively small storage quota, rather you should place everything involving HW6 in your scratch directory, which has more storage quota.
3. Fortunately, PACE has several anaconda installations available, you do not have to install anaconda from the source by yourself and you can simply use module load instead. Remember every time you log in to PACE, you should re-load module load procedure.
  - a. Check available anaconda installations by this command `module spider anaconda`

```
[xchen920@login-ice-1 ~]$ module spider anaconda
```

```
-----
anaconda3:
-----
```

```
  Versions:
```

```
    anaconda3/2021.05
```

```
    anaconda3/2022.05
```

```
    anaconda3/2022.05.0.1
```

```
-----
For detailed information about a specific "anaconda3" pa
Note that names that have a trailing (E) are extensions
For example:
```

```
    $ module spider anaconda3/2022.05.0.1
```

- b. Download the conda by using the command: `module load anaconda3/2022.05.0.1`

```
[xchen920@login-ice-1 ~]$ module load anaconda3/2022.05.0
(base) [xchen920@login-ice-1 ~]$
```

if you see the base environment, then you are all set. Remember, you need to reload the module everytime you re-log into shell.

- c. Last, check your python version again, it should be python3. Mine is python3.9.12.

```
(base) [xchen920@login-ice-1 ~]$ python -V
Python 3.9.12
```

## 4. Conda Virtual Environment and Conda Install Packages

1. Before we install packages like `pytorch` , we need to create conda virtual environment.

- a. Use command line `conda env list` to check what environments you have. You should have a base environment and see an output like this:

```
(base) [xchen920@login-ice-1 ~]$ conda env list

# conda environments:
#
base                  *  /usr/local/pape-apps/manual/package:
```

- b. Use `conda create --name funml` to create the virtual environment. (You can replace funml with your own ENV-NAME). Then use `conda env list` again, you should see an output like this:

```
(base) [xchen920@login-ice-1 ~]$ conda env list
# conda environments:
#
funml                  /home/hice1/xchen920/.conda/envs/funml
base                   * /usr/local/pace-apps/manual/packages/
```

c. If you want to delete the virtual environment, then use commands below. It might take some time.

```
(funml) [xchen920@login-ice-1 ~]$ conda deactivate
(base) [xchen920@login-ice-1 ~]$ conda remove -n funml --all

...
#[y/n]? simply enter y as yes to delete
...
```

## 2. Install packages:

a. `conda install pytorch::pytorch` to install pytorch

```
(funml) [xchen920@login-ice-1 ~]$ conda install pytorch::pytorch

...
[y/n]? -y
...
```

b. `conda install pytorch::torchvision` to install torchvision, similarly.

c. How to check if your packages are installed correctly? In terminal, you can do this:

```
(funml) [xchen920@login-ice-1 ~]$ python
Python 3.12.2 | packaged by Anaconda, Inc. | (main, Feb 27 2024)
Type "help", "copyright", "credits" or "license()" for more
>>> import torch
>>> from torchvision.datasets import ImageFolder
```

```
>>> from torchvision import transforms
>>> exit()
(funml) [xchen920@login-ice-1 ~]$
```

## 5. Conda install Jupyter Notebook

1. Conda install Jupyter Notebook:

```
conda install -c conda-forge jupyterlab # or alternatively, (
```

2. Conda install the `ipykernel` package to support Jupyter:

```
conda install ipykernel
```

See **Open OnDemand section** to open your file in Jupyter Notebook:

<https://gatech.service-now.com/home?>

[id=kb\\_article\\_view&sysparm\\_article=KB0043479](https://gatech.service-now.com/home?id=kb_article_view&sysparm_article=KB0043479)

## Appendix

1. Intro to H100 nodes (the ones for AI-Makerspace):

<https://gatech.service-now.com/home?>

[id=kb\\_article\\_view&sysparm\\_article=KB0043479](https://gatech.service-now.com/home?id=kb_article_view&sysparm_article=KB0043479)

2. Anaconda:

<https://gatech.service-now.com/home?>

[id=kb\\_article\\_view&sysparm\\_article=KB0041621](https://gatech.service-now.com/home?id=kb_article_view&sysparm_article=KB0041621)

3. Pytorch:

<https://gatech.service-now.com/home?>

[id=kb\\_article\\_view&sysparm\\_article=KB0041546](https://gatech.service-now.com/home?id=kb_article_view&sysparm_article=KB0041546)