

# Getting started with Open Cognitive Environment (OpenCE, former WMLCE)

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## Open Cognitive Environment

Welcome to the **OpenCE** project. The project contains everything that is needed to build conda packages for a collection of machine learning and deep learning frameworks. All packages created for a specific version of OpenCE have been designed to be installed within a single conda environment.

See [Getting Started with Python Environment on HAL System](#) for a detailed list of package versions in each environment.

## Simple Example with TensorFlow

### Interactive mode

Get a node for interactive use:

```
swrun -p gpux1
```

Once on the compute node, load PowerAI module using one of these:

```
module load opence
module load opence-v1.3.1
```

Copy the following code into file "mnist-demo.py":

```
import tensorflow as tf
mnist = tf.keras.datasets.mnist

(x_train, y_train), (x_test, y_test) = mnist.load_data()
x_train, x_test = x_train / 255.0, x_test / 255.0

model = tf.keras.models.Sequential([
    tf.keras.layers.Flatten(input_shape=(28, 28)),
    tf.keras.layers.Dense(512, activation=tf.nn.relu),
    tf.keras.layers.Dropout(0.2),
    tf.keras.layers.Dense(10, activation=tf.nn.softmax)
])
model.compile(optimizer='adam',
              loss='sparse_categorical_crossentropy',
              metrics=['accuracy'])

model.fit(x_train, y_train, epochs=5)
model.evaluate(x_test, y_test)
```

Train on MNIST with keras API:

```
python ./mnist-demo.py
```

### Batch mode

The same can be accomplished in batch mode using the following [tf\\_sample.swb](#) script:

```
wget https://wiki.ncsa.illinois.edu/download/attachments/82510352/tf_sample.swb
sbatch tf_sample.swb
squeue
```

## Visualization with TensorBoard

### Interactive mode

Get a node for interactive use:

```
swrun -p gpux1
```

Once on the compute node, load PowerAI module using one of these:

```
module load opence
module load opence-v1.3.1
```

Download the code [mnist-with-summaries.py](#) to \$HOME folder:

```
cd ~
wget https://wiki.ncsa.illinois.edu/download/attachments/82510352/mnist-with-summaries.py
```

Train on MNIST with TensorFlow summary:

```
python ./mnist-with-summaries.py
```

### Batch mode

The same can be accomplished in batch mode using the following [tfbd\\_sample.swb](#) script:

```
wget https://wiki.ncsa.illinois.edu/download/attachments/82510352/tfbd_sample.swb
sbatch tfbd_sample.swb
squeue
```

### Start the TensorBoard session

After job completed the TensorFlow log files can be found in "~/tensorflow/mnist/logs", start the TensorBoard server on hal-ondemand, detail refers [Getting started with HAL OnDemand](#).

## Simple Example with Pytorch

### Interactive mode

Get a node for interactive use:

```
swrun -p gpux1
```

Once on the compute node, load PowerAI module using one of these:

```
module load opence
module load opence-v1.3.1
```

Install samples for Pytorch:

```
pytorch-install-samples ~/pytorch-samples  
cd ~/pytorch-samples
```

Train on MNIST with Pytorch:

```
python ./examples/mnist/main.py
```