

* You can download filters,
and use them.

— could consume 5GB RAM, memory
intensive.

Workshop 6

COMP90051 Machine Learning

Semester 2, 2018



Learning Outcomes

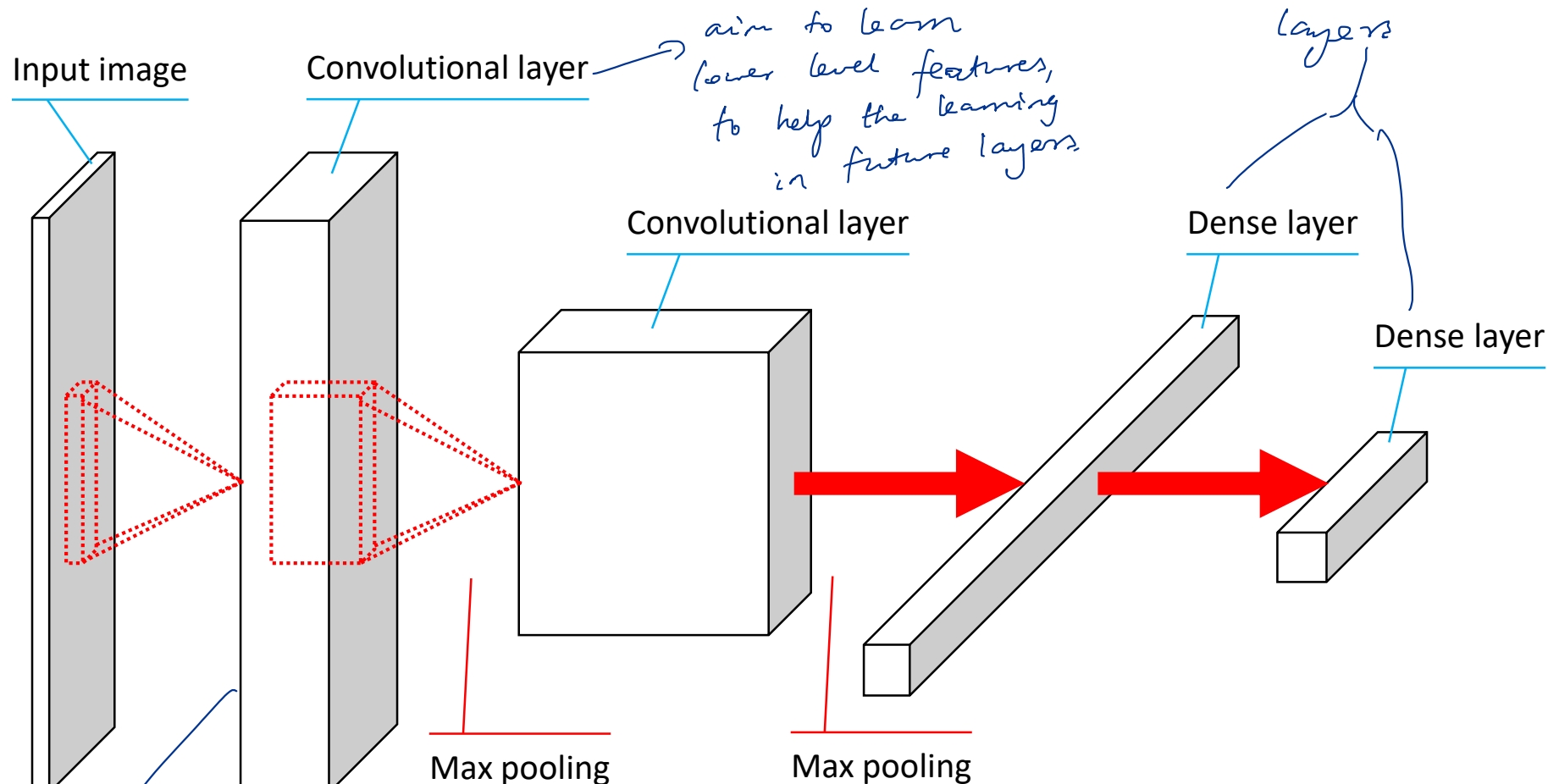
By the end of this workshop you should be able to:

1. Explain how **convolutional** and **max pooling** layers operate
2. Implement a **convolutional neural net** (CNN) in TensorFlow
3. Monitor your TensorFlow session in **TensorBoard**

→ web app

(MNIST) data

CNN architecture



in lab machines
small no. of filters

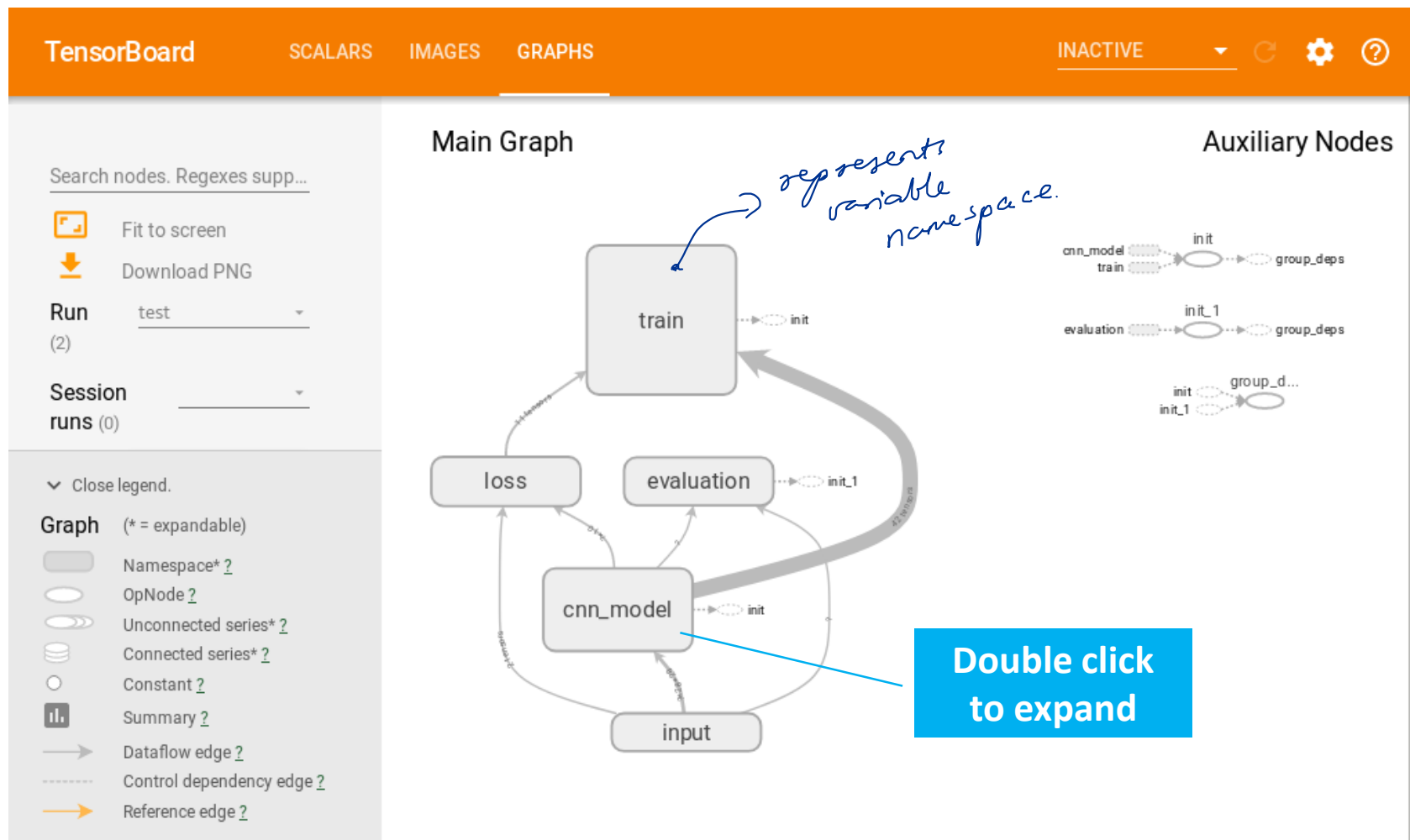
New this week

Monitoring TensorFlow programs

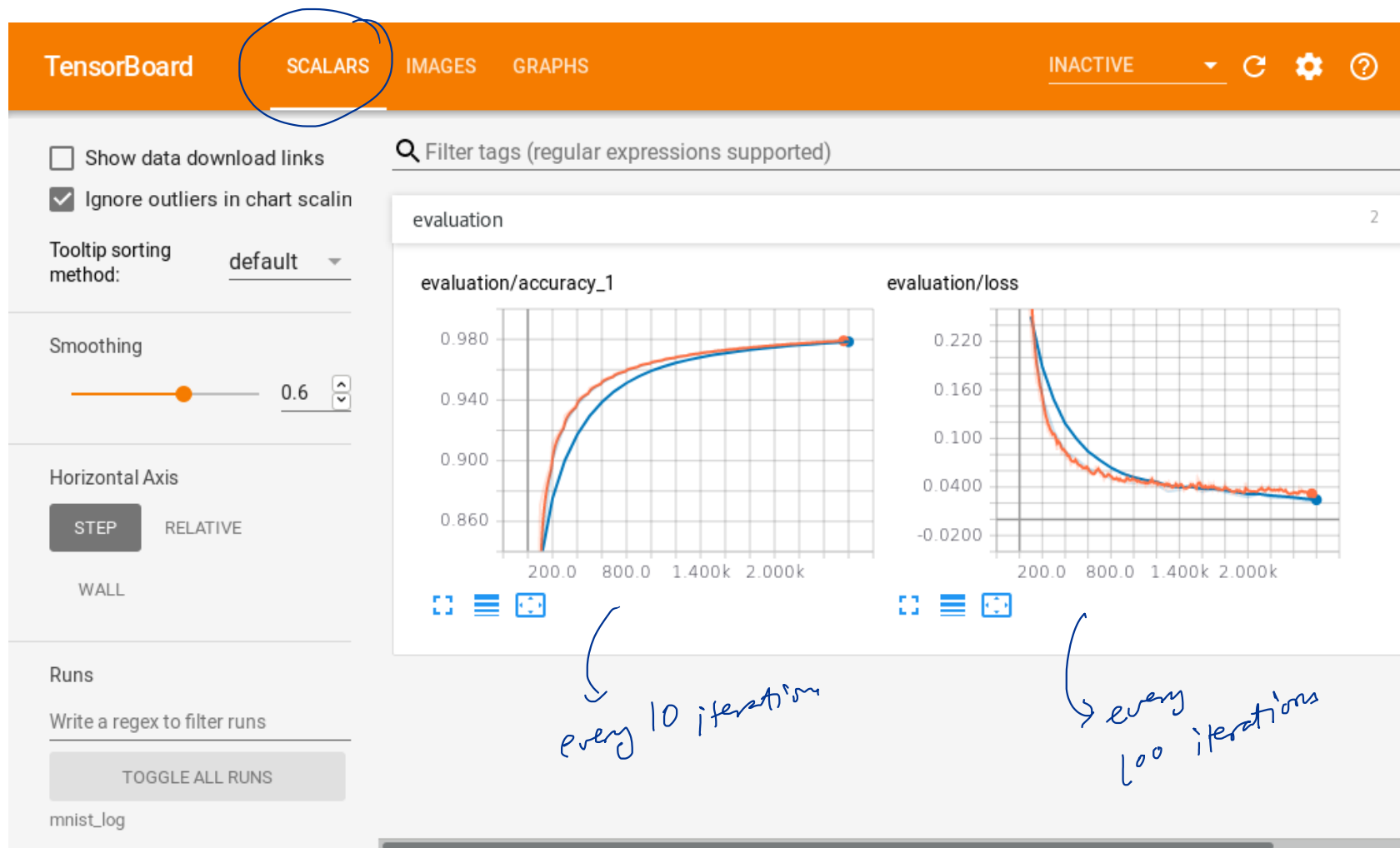
- Use **TensorBoard** – a web app bundled with TensorFlow
- Presents data in **event files** which are generated while TensorFlow is running
- You can add to these event files:
 - * Define **Summary ops** for quantities you want to monitor
 - * Request the Summary ops in a `tf.Session`
 - * Write to disk using a `tf.summary.FileWriter`
- Code written for you in Worksheet 6

*tensorflow writes
event files when running.
which is read by TB*

Explore the computation graph



Monitor scalar summaries



Monitor image summaries

TensorBoard

SCALARS IMAGES GRAPHS

INACTIVE

☐ Show actual image size

Brightness adjustment

Contrast adjustment

Runs

Write a regex to filter runs

☒ test

☒ train

mnist_log

Filter tags (regular expressions supported)

cnn_model

cnn_model/conv_layer_1_1/visualization/filters/image/0

train

step 2,500

Sat Aug 25 2018 12:22:06 GMT+1000 (AEST)

8 filters in first convolution layer.

A filter in the first CNN layer

learned from the data.

TensorBoard on the lab machines

Once TensorFlow is installed:

- Open *Start* → *Anaconda3 (64-bit)* → *Anaconda Prompt*
- In the prompt, run the following commands:
 - > `cd "C:\Users\%USERNAME%\Downloads\workshop06"`
 - > `python -m tensorboard.main --logdir mnist_log --host localhost`
- Open <http://localhost:6006> in your web browser

On your own device, you can start TensorBoard by running:

```
> tensorboard --logdir %LOGDIR% --host localhost
```


TensorFlow on the lab machines

- Open *Start* → *Anaconda3 (64-bit)* → *Anaconda Prompt*
- In the prompt, run the following commands:
 - > `cd "C:\Users\%USERNAME%\Downloads"`
 - > `mkdir workshop06`
 - > `cd workshop06`
 - > `pip install -t . tensorflow "protobuf<3.6.1"`
 - > `jupyter notebook`
- Copy Worksheet 6 into the `workshop06` directory
- Open Worksheet 6 from within Jupyter

Note: This is a workaround installation method due to restrictions on the lab machines. On your own device, we recommend following the installation instructions at <https://tensorflow.org/install/>