Workshop 6

COMP90051 Machine Learning

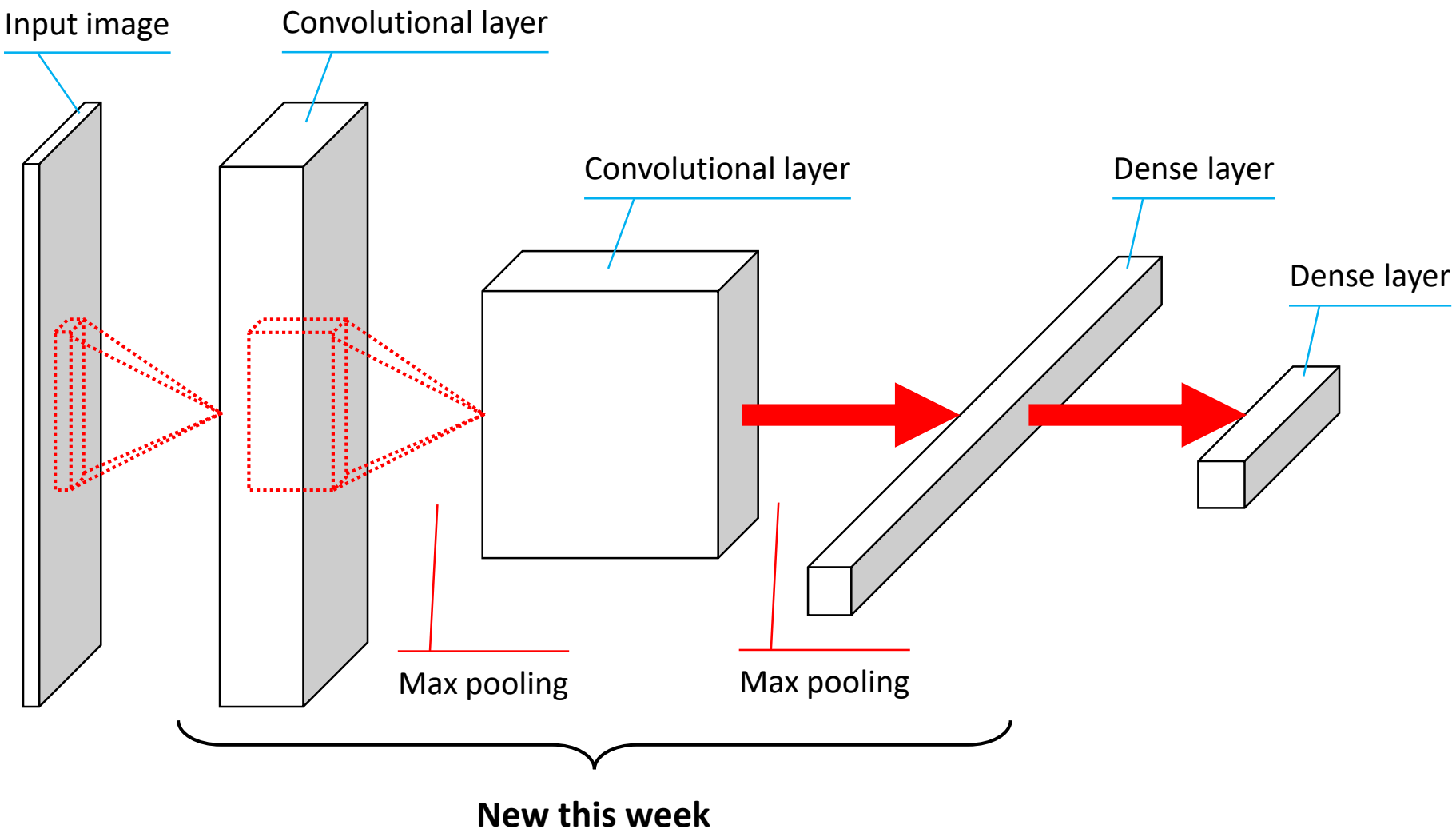
Semester 2, 2018

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

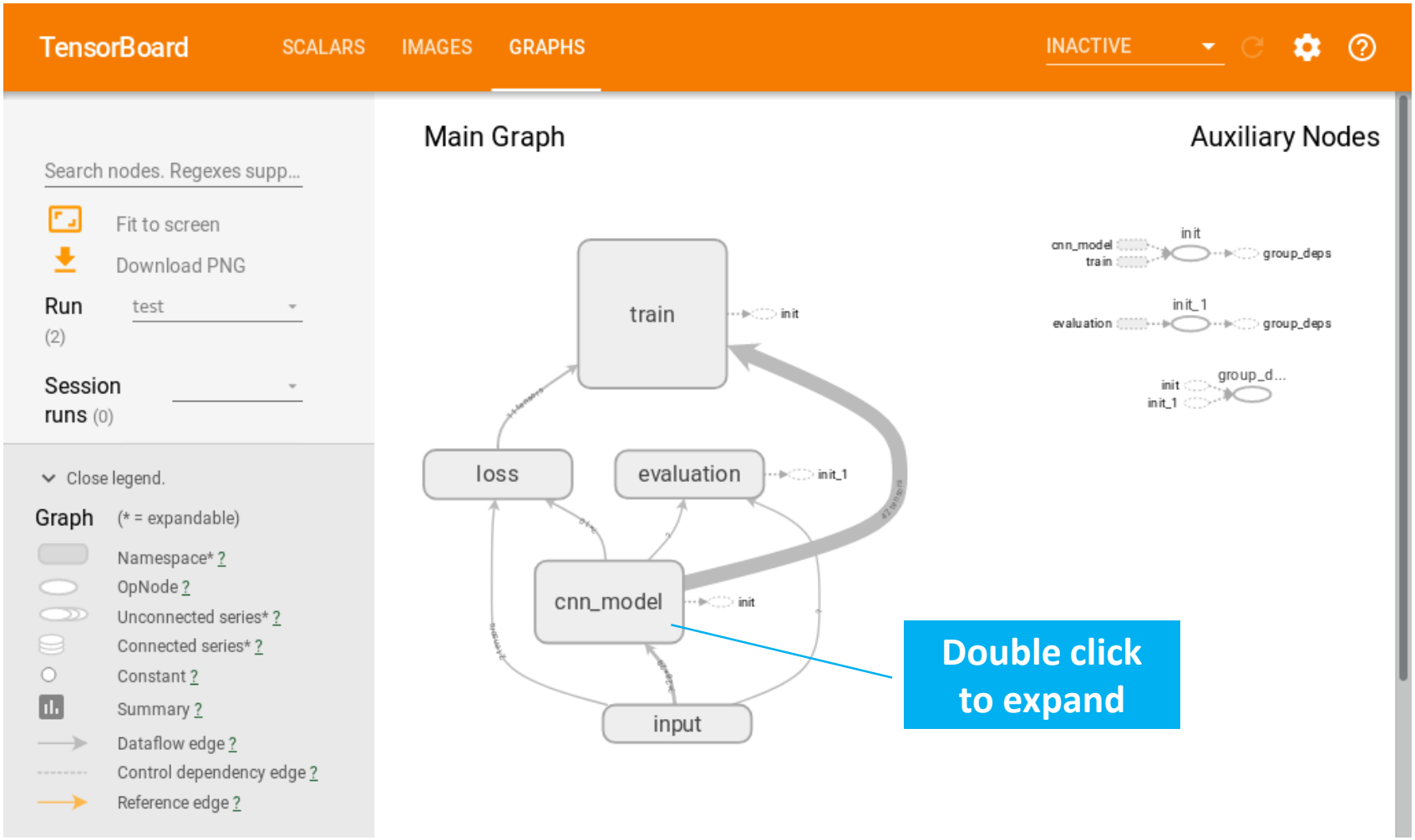
CNN architecture



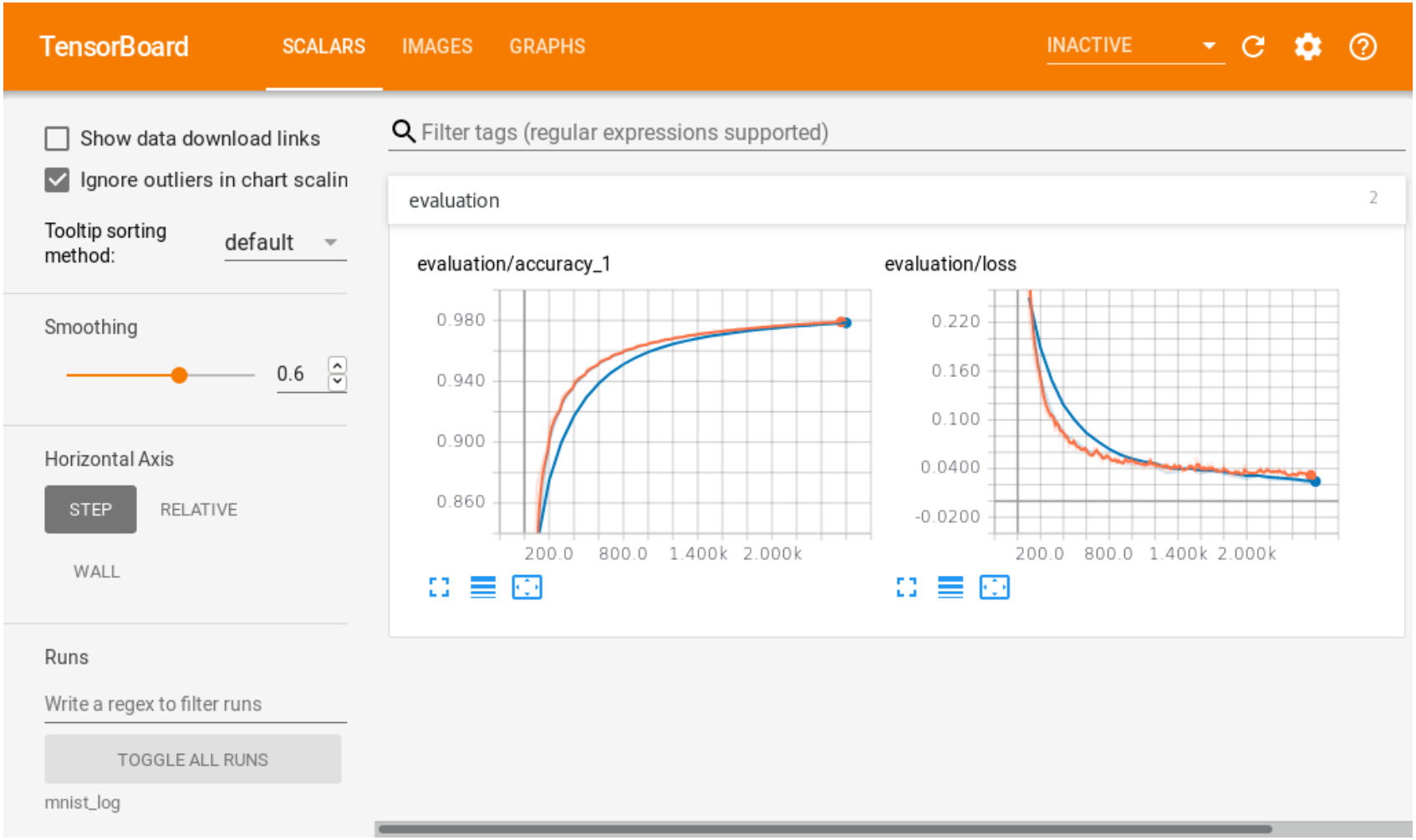
Monitoring TensorFlow programs

- 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

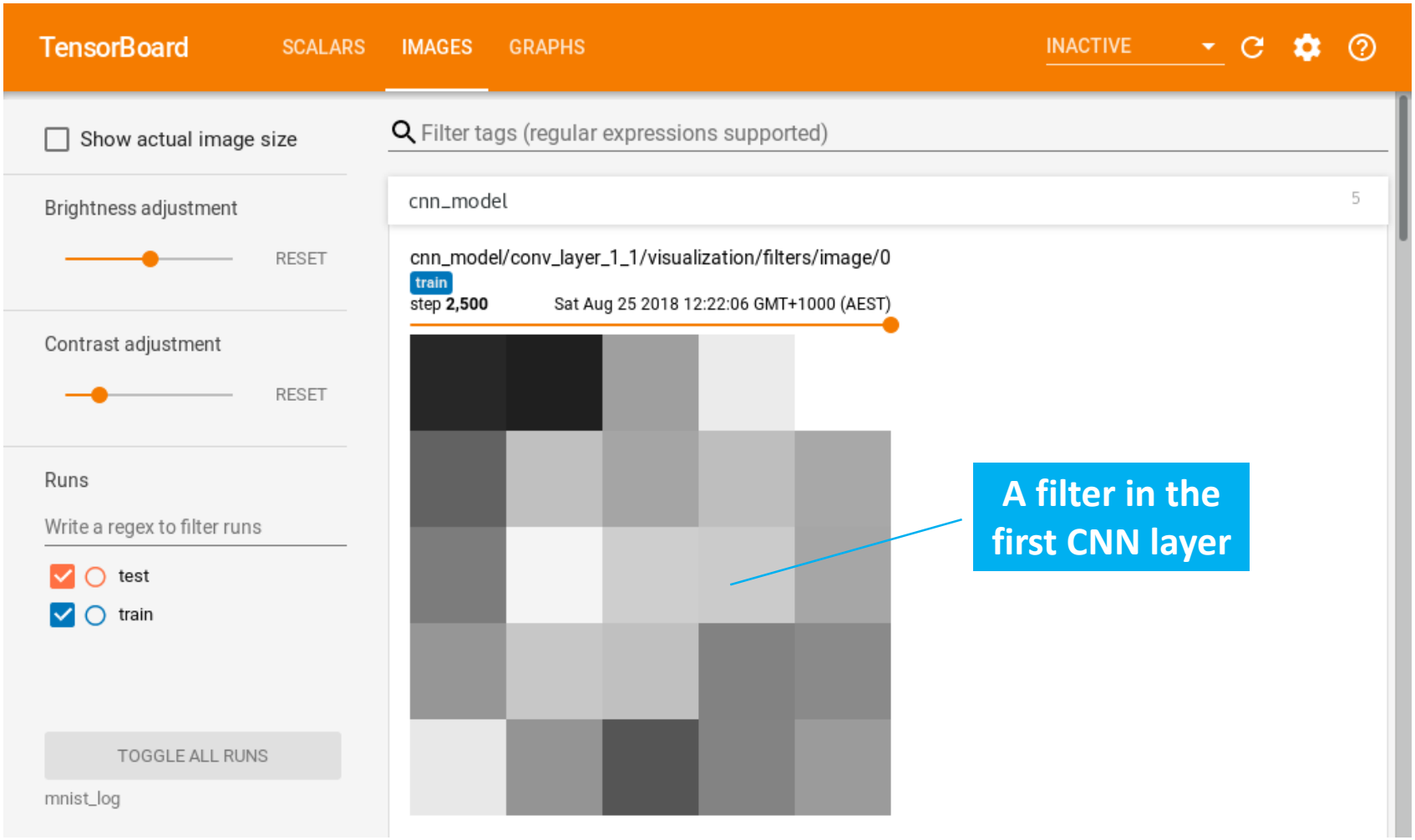
Explore the computation graph



Monitor scalar summaries



Monitor image summaries



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/