Torch Introduction

Running Torch on the server of CS department

Windows users: make sure you have X started (see Section 2.1 below)

Step 1:   **ssh -X -Y netid@cs594.cs.uic.edu**

You may check for the usernames at http://go.uic.edu/csaccount. If you have never used your account, then your initial password is your UIN. You may change your password using the following command: yppasswd.

Step 2: Run the following commands

    bash

    source /home4/fac4/zhangx/torch/install/bin/torch-activate

    th

It should bring up the torch interactive console. You may add the second line to ~/.bashrc (or ~/.bash_profile, ~/.profile).

Step 3. Next we test image display. First type

    os.exit()

to exit the console. Then run in Linux bash

    qlua -e "require('trepl')()"

to start a torch console with qt support. Then run in it:

    require 'image'

    im = image.lena()

    image.display(im)

If that brings up an old lady, then it's all done. I've installed some modules like 'gm', 'unsup'. In case any other modules are needed, please just send me an email and I'll install them (it needs write permission to the installation directory).

To use ssh-key to avoid typing your password when logging into a remote server, see http://www.thegeekstuff.com/2008/11/3-steps-to-perform-ssh-login-without-password-using-ssh-keygen-ssh-copy-id

2. Installing and accessing Torch on your own machine

Torch download page: http://torch.ch/docs/getting-started.html#_

2.1 Windows user:

I installed Fedora 24 on my laptop, alongside my window 7. I pursued the following steps:

1. Download a Fedora installation image from
   https://getfedora.org/en/workstation/download/
2. Download a software *liveusb-creator* from
   https://fedorahosted.org/liveusb-creator/
3. Create a bootable (live) USB (2 GB suffices) by using liveusb-creator based on the image
4. Carve out a partition of at last 15 GB on Windows. Don't give it a volume label and don't format it on Windows.
5. Reboot into Fedora on the USB, and then install Fedora into the new partition. I used 500 MB for '/boot', 1 GB for 'swap', 3 GB for '/home', and the rest for '/'.
6. Now every time the machine is rebooted, I can choose between Fedora and Win 7.

Steps 1-3 can be watched from 1-3 minutes of

https://www.youtube.com/watch?v=P-4FLqoobtY

Steps 4-5 can be watched from the whole video at

https://www.youtube.com/watch?v=Og2ToA6NNfw

See the text narrative in the youtube description (below the video)

Installing torch on Fedora 24 is trivial; just follow the three lines at

http://torch.ch/docs/getting-started.html#_

If you want to make your Linux machine accessible by ssh (from other machines), start ssh server:

    /sbin/service sshd start

To check IP address on linux: ifconfig

SSH to a remote server to use Torch

If you use Windows and ssh to any remote server, you will need to install some software on your Windows machine. I use Cygwin: https://www.cygwin.com/. Make sure you include the XWin and ssh when installing Cygwin. Then start a console and run "startx&". In XWin, ssh to the server by running

    ssh -X -Y netid@servername

(I know either -X or -Y will suffice, but it's always unclear which one and so I just include both)

I also use WinSCP to remotely access files: https://winscp.net/eng/index.php. If you want further convenience by mapping the server as a new drive on Windows, try this free software: https://www.eldos.com/sftp-net-drive/download-release.php#product

2.2 Ubuntu user:

If install-deps complains about python-software-properties, then replace line 139 of install-deps with following command:

sudo apt-get install -y software-properties-common

2.3 Verify the installation is successful (on any platform)

If you don't need to show images, then just run "th" to start the interactive console, or run in the Linux console "$ th file.lua" to do it non-interactively.

If you want to display any image (qt): then you can do it either
- a) interactively: first execute in the Linux console:

    $qlua -e "require('trepl')()"

    and then in the Torch interpreter, use dofile to run the script:

    th> dofile 'file.lua'
- b) or non-interactively on the Linux console: just execute

    $qlua file.lua

To install a new package called "gm", run in Linux console:

    luarocks install gm

3. Path of learning/reading:

1. Download Torch and install: http://torch.ch/docs/getting-started.html#_

2. Learn Lua: http://tylerneylon.com/a/learn-lua/

3. Learn basic Torch: https://github.com/torch/torch7/wiki/Cheatsheet#tutorials, in particular:

   https://github.com/torch/tutorials/blob/master/1_get_started.ipynb

   https://github.com/soumith/cvpr2015/blob/master/Deep%20Learning%20with%20Torch.ipynb

4. **<u>Skim</u>** through the fundamentals of tensor and math operations:

   (a) Tensor manipulation: https://github.com/torch/torch7/blob/master/doc/tensor.md, in conjunction with this page if you are used to numpy, and this document If you are used to Matlab.

   (b) Math operations: https://github.com/torch/torch7/blob/master/doc/maths.md

   Make sure you understand the *in-place* construction and resulting savings in computation. Torch is obsessed with performance!

5. Work on machine learning!

   Walk through the tutorials 1-5 at

      https://web.archive.org/web/20160201031326/http://code.madbits.com/wiki/doku.php

   The associated code for the tutorial can be obtained from

      https://github.com/torch/tutorials

   Some equations on web.archive.org cannot be displayed well. In such cases, go to the corresponding sections at https://github.com/clementfarabet/ipam-tutorials/tree/master/th_tutorials[1] and you will find the latex code there. For example, in "Step 3: Loss Function" of

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[1] This seems to be a mirror of web.archive.org, but the latter looks more updated and detailed.

https://github.com/clementfarabet/ipam-tutorials/blob/master/th_tutorials/1_supervised/README.md

you can see $$ L = \sum_n l(y^n,t^n) $$. If you are not familiar with latex, just copy the latex equations to a web site for translation, e.g., https://www.codecogs.com/latex/eqneditor.php.