Fastai Study Group

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Cleveland AI Group (CAIG)
October 1, 2018 - Week 1

Event Hosts

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Agenda

1. Questions to Group
2. Paperspace Quick Setup Demo   (Brendan)
3. Google Cloud Platform Demo   (Michael)
4. Lesson 1 Notebook Demo   (Michał)
5. Discussion/questions, e.g.:
    a. Lesson 1 video content
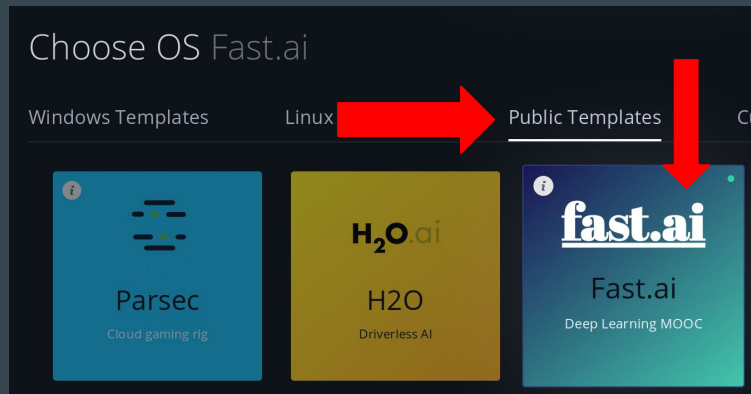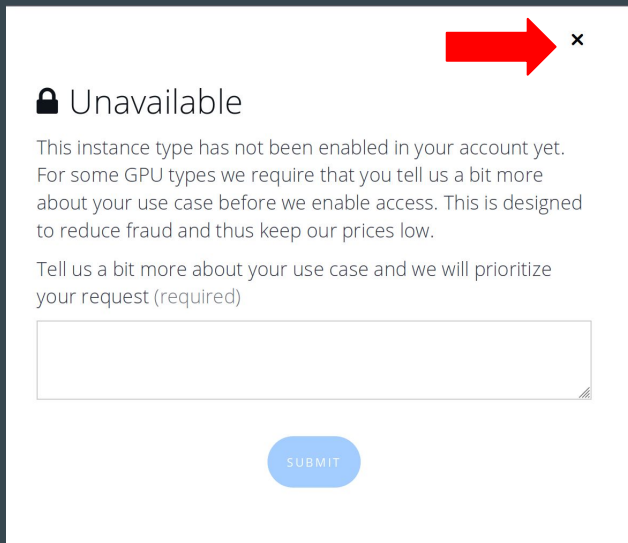   b. Lesson 1 jupyter notebook
    c. <u>Related</u> thoughts

Quick Questions

1. How many people were able to:

   a. Watch the video?

   b. Run lesson 1 notebook somewhere (Paperspace/GCP/AWS/Local, etc.)?

2. Are you enjoying the course so far?

3. Would anyone like to see setup demos?

Paperspace Setup Demo

Follow the [fast.ai lesson 1 video](#) for more details!

1. Sign up on www.paperspace.com
   a. Michał's [referral link here](#) or Brendan's [referral link here](#)
   b. Use promo code <u>FASTAI6GKZ</u>
2. Create a new virtual machine (VM)
   a. Use public templates
   b. Click "x" out of the dialog that pops up
   c. Click fast.ai
   d. Snapshots <u>OFF</u> & Public IP <u>ON</u>
3. Get email with temp password
4. After login to VM, run <u>passwd</u>

🔒 Unavailable

This instance type has not been enabled in your account yet. For some GPU types we require that you tell us a bit more about your use case before we enable access. This is designed to reduce fraud and thus keep our prices low.

Tell us a bit more about your use case and we will prioritize your request (required)

SUBMIT

Choose OS Fast.ai

Windows Templates   Linux   Public Templates

Parsec
Cloud gaming rig

H₂O.ai
H2O
Driverless AI

fast.ai
Fast.ai
Deep Learning MOOC

Google Cloud Platform Demo

1. Sign up at https://cloud.google.com/
   a. Be sure to take advantage of the $300 free credit
2. Request access to GPU (K80 or P100)
3. Set firewall rules
4. Create new VM with 4 vCPUs and 26 GB of RAM
   a. This recommended but not needed to run the notebooks
5. Use bash script to setup environment
   a. Curl https://gist.githubusercontent.com/kuds/81d7dc1badbe5c0e527c604672831c2c/raw/200d22b4aa289e6805966f04ba866eaa0ab1d4e4/FastAI%2520Google%2520Cloud%2520Platform | bash
6. For More Information

Lesson 1 and course overview

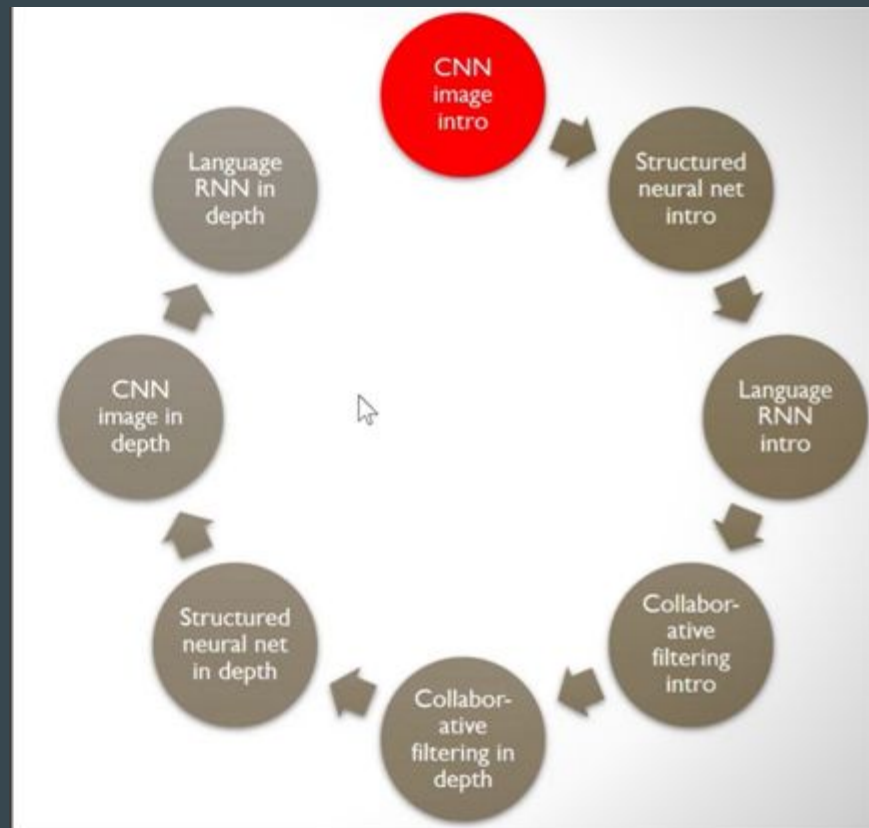Recognising cats and dogs (introduction to image classification)

Top down approach

NN with three lines of code

Peel back layers to look deeper

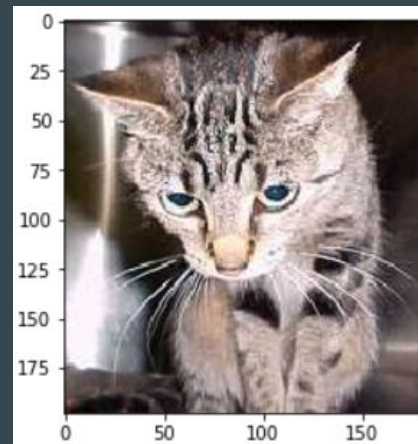Fastai library includes 'state of the art' deep learning research

PyTorch as deep learning library

Lesson 1


```
data = ImageClassifierData.from_paths(PATH,
tfms=tfms_from_model(resnet34, sz))
learn = ConvLearner.pretrained(resnet34, data, precompute=True)
learn.fit(0.01, 3)

[ 0.        0.04955  0.02605  0.98975]
[ 1.        0.03977  0.02916  0.99219]
[ 2.        0.03372  0.02929  0.98975]
```
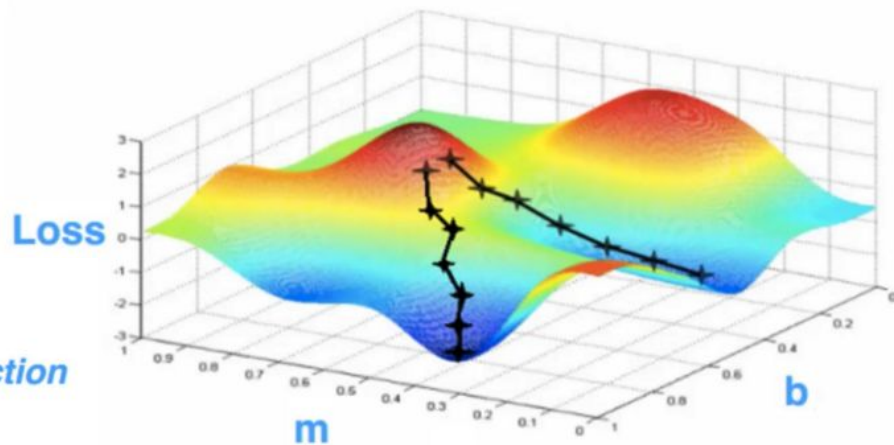

https://medium.com/@hiromi_suenaga/deep-learning-2-part-1-lesson-1-602f73869197

Lesson 1

Gradient Descent

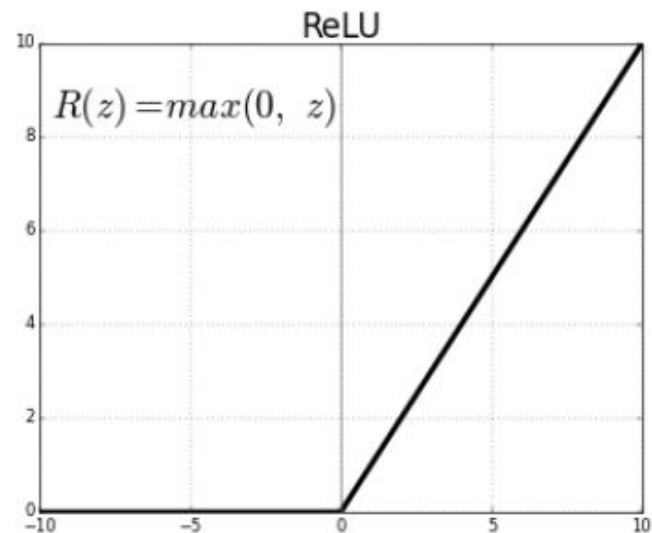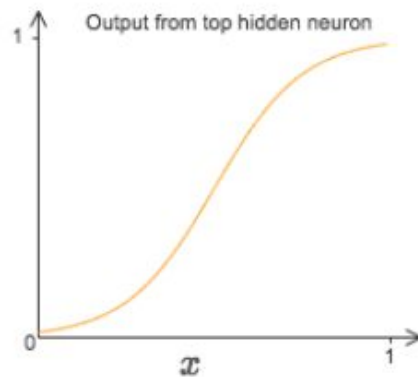*f (x) = nonlinear function of x*

Loss
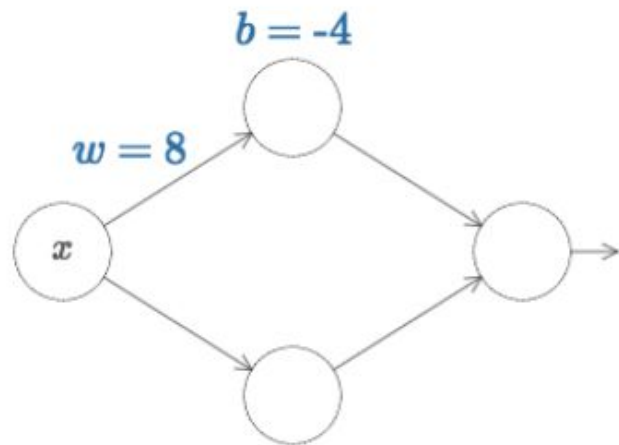
m

b

Neural Network

f (X) = nonlinear function composed of

Σ, Π, S

$S(x) = 1 / (1 - e^x)$

Back Propagation of weights

Bias 1

Bias 2

i1 → W1

i2 → W2

i3 → W3

i4 → W4

i5 → W5

i6 → W6

Σ

Σ

Σ

Σ

W_{H1}

W_{H2}

W_{H3}

Input layer

Hidden Layer

Output Layer

Lesson 1

computer

$$\left(\begin{matrix} 111 & 119 & 103 \\ \times -1 & \times -1 & \times -1 \\ 76 & 62 & 83 \\ \times -1 & \times 8 & \times -1 \\ 117 & 133 & 126 \\ \times -1 & \times -1 & \times -1 \end{matrix} \right)$$

= -372

kernel:
outline

input image   output image

$b = -4$

$w = 8$

x

Output from top hidden neuron

1

0   x 1

ReLU

$R(z) = max(0, \; z)$
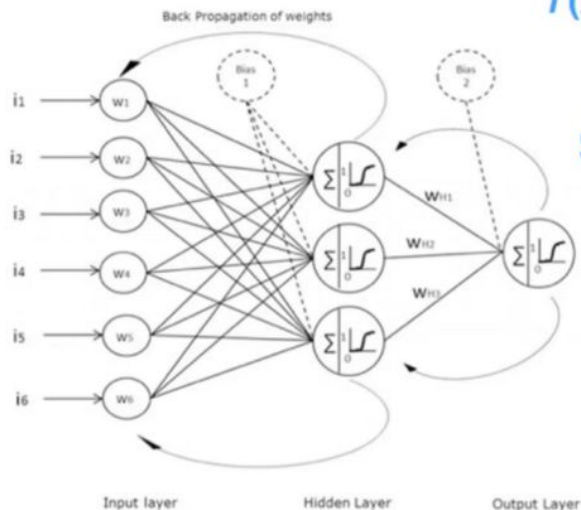
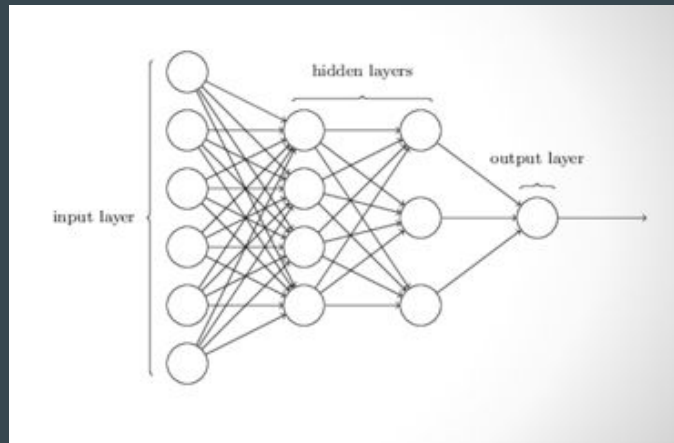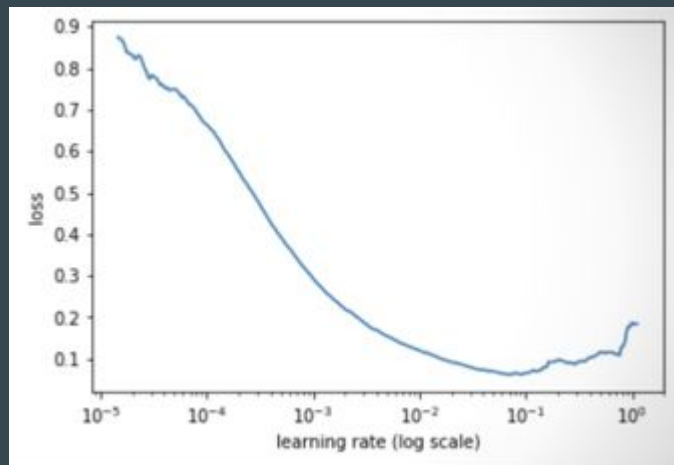Sigmoid and ReLU

Decisions

Choosing a learning rate

Choosing the number of epochs

Choosing the number of hidden layers

Choosing the minibatch size

Choosing the image size

Fast.ai "Wiki"

- Go to http://forums.fast.ai/t/wiki-lesson-1/9398

- Lesson notes are great

Lesson notes

- Lesson notes from @timlee
- Lesson notes 2.8k from @hiromi
- Annotated lesson notes 569 from @zerotosingularity

Resources

- Course page   http://course.fast.ai/
- Course forums   http://forums.fast.ai/
- Cleveland Tech Slack   https://cleveland-tech.herokuapp.com/
    - Join #deep_learning channel
    - Ask questions or share articles
- AI Saturdays   https://nurture.ai/ai-saturdays
- AI Saturdays guide   Link
- AI Saturdays forums   https://ai6forums.nurture.ai/
- CAIG Website   https://clevelandaigroup.github.io/

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Questions?

Extra Slides

Fast.ai Live course starts October 22

Watch the lessons via Youtube Live in real-time, with access to the in-class discussion.

Everyone who applies, and has been coding for at least a year, can join!

The new course will be nearly entirely new material, and will use the new (rewritten from scratch) fastai v1 library.

If you miss the deadline or you have some problem with your application, don't worry - the full course will be online early next year.

Link to course info incl dates,