

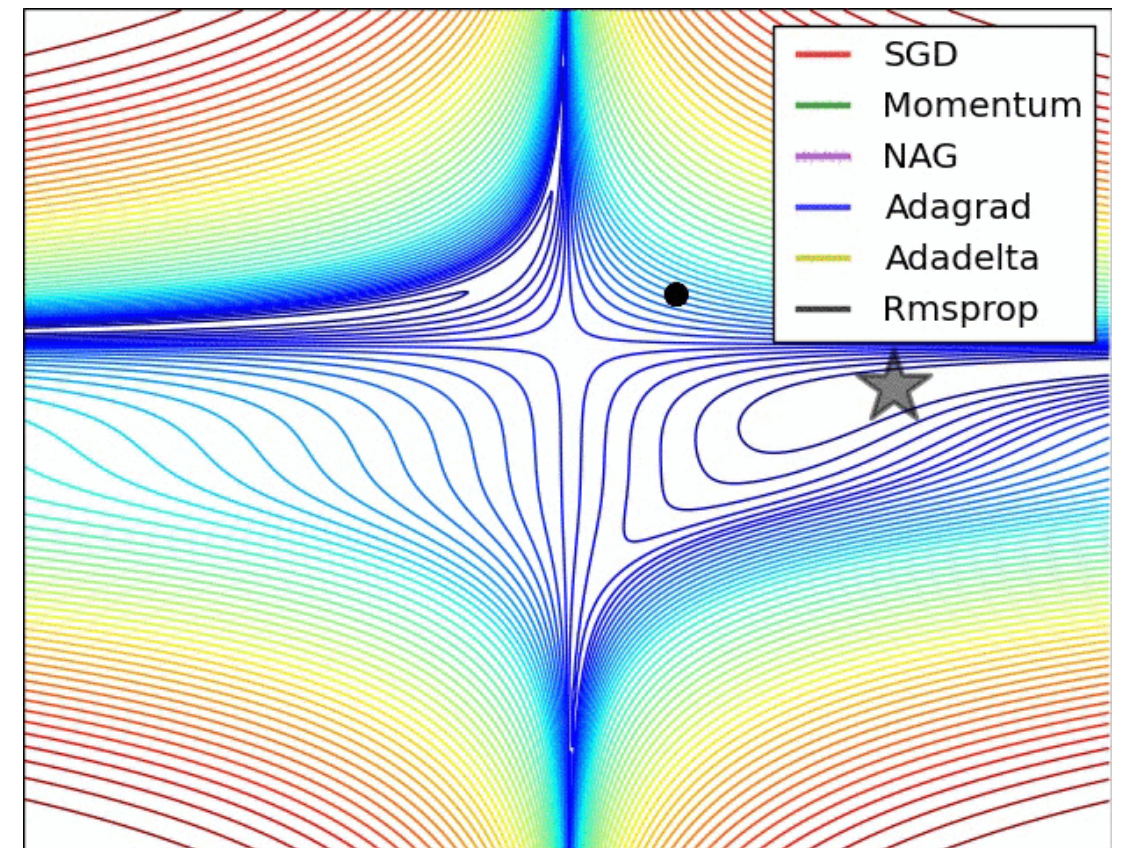
Supposedly CNEl's Deep Neural
Networks tutorial made into an
internet scale presentation
(tkx Matt)

@edersantana
edersantana.github.io
bit.ly/deep_tutorial

What is
Deep Learning
about?

Deep Learning
is about
Neural Networks

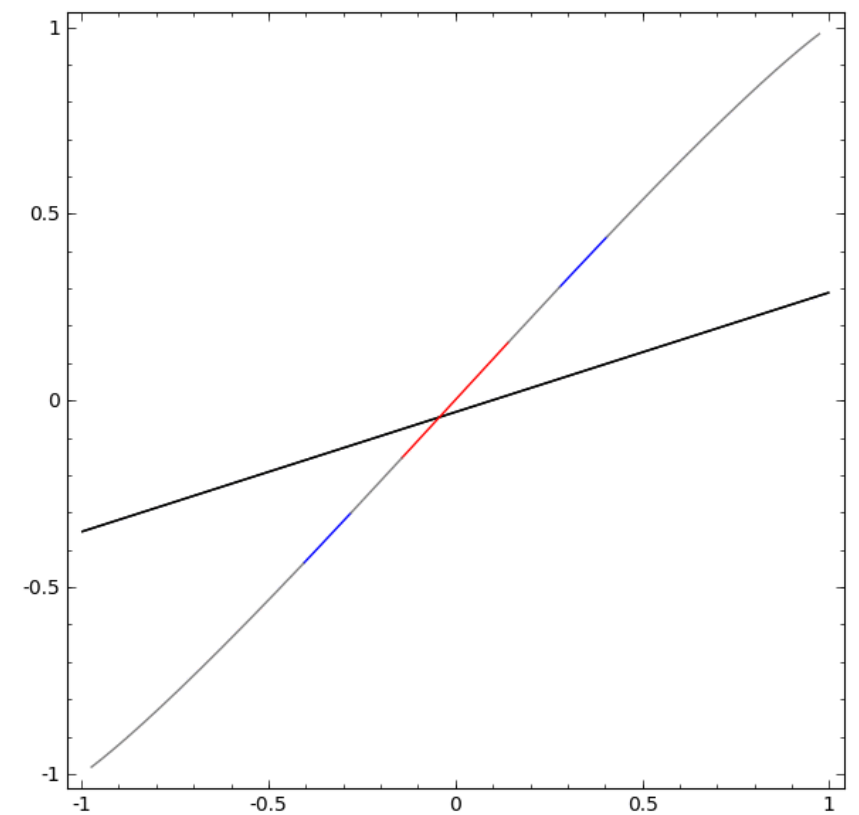
Deep Learning is about Optimization



by Alec Redford @alecrad

$$p(w|S) = p(S|w)p(w)/p(S)$$

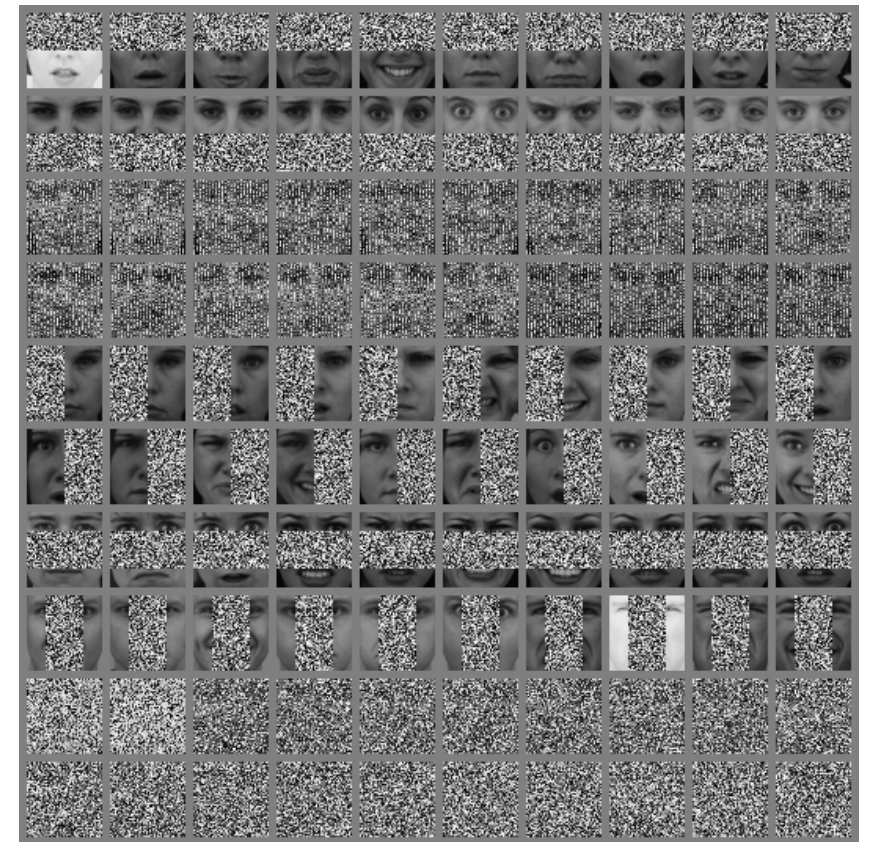
Deep Learning is about Supervised Learning



by Christopher Olah (colah.github.io)

$$\begin{aligned} P(c|x, S) &= \int p(c|x, w) p(w|S) dw \\ &= p(c|x, \underline{w}) \\ \underline{w} &= \arg \max p(S|w) p(w) \end{aligned}$$

Deep Learning is about Unsupervised Learning



Laurent Dinh, et. al. ICLR 2015

$$p(x) = \int p(x|z, w) p(z, w) dz dw$$
$$p(z|x, w) = p(x|z, w) p(z, w) / p(x)$$

A woman with blonde hair tied back with a large pink bow is shown from the chest up. She is wearing a light blue textured cardigan over a white collared shirt with a decorative brooch. Her eyes are closed and her mouth is open in an 'O' shape, suggesting surprise or awe. The background is a solid light pink color.

All about that Bayes

Such Deep,
Much wow

But then, what distinguishes
so-called "deep neural
networks" from the neural
networks of yesteryear?

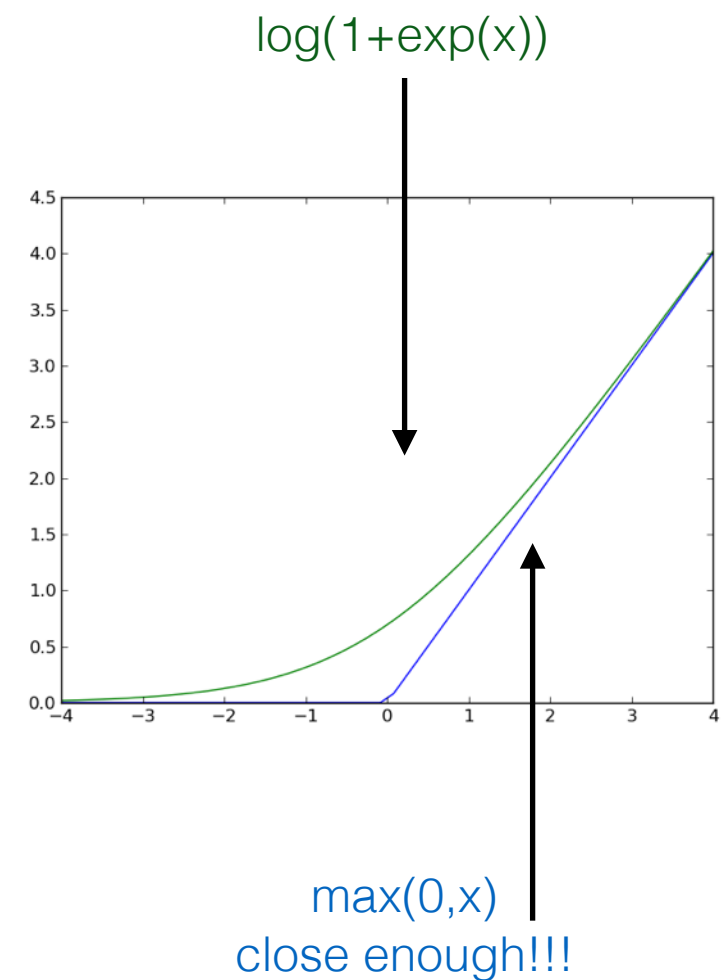
[my answer at quora.com](#)

[my 3 pages discussion](#)

Proves that a single hidden layer neural network with hidden neurons enough can estimate ANY function with arbitrary precision...

...doesn't say anything if a stochastic gradient algorithm can find the weights in finite time. My interpretation from what I read at [Goodfellow et. al. ICLR 2015]

Deep Learning
is also about
different
activation
functions



Deep Learning
is also about
different
affine
transformations

1 _{x1}	1 _{x0}	1 _{x1}	0	0
0 _{x0}	1 _{x1}	1 _{x0}	1	0
0 _{x1}	0 _{x0}	1 _{x1}	1	1
0	0	1	1	0
0	1	1	0	0

Image

4		

Convolved
Feature

Deep Learning
is also about
different
number
crunching hardware



timdettmers

Deep Learning
is also about
dropout, NAG,
better initialization,
and many more cool stuff

Brace yourselves
Live demo is coming



Deep Learning
got me, where do I go
from here?

Eder's path:

Coursera → Theano → Profit!

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