



BUSINESS 2019
JULYEDU

PyTorch公开课

北京七月在线科技有限公司

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<https://www.julyedu.com/>



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01

深度学习模型入门

Supporting text here.

When you copy & paste, choose "keep text only" option.

什么是机器学习?

Study of algorithms that

- improve their performance P
- at some task T
- with experience E

well-defined learning task: $\langle P, T, E \rangle$

来自Tom M. Mitchell, Machine Learning Course

Modeling, Inference, Learning

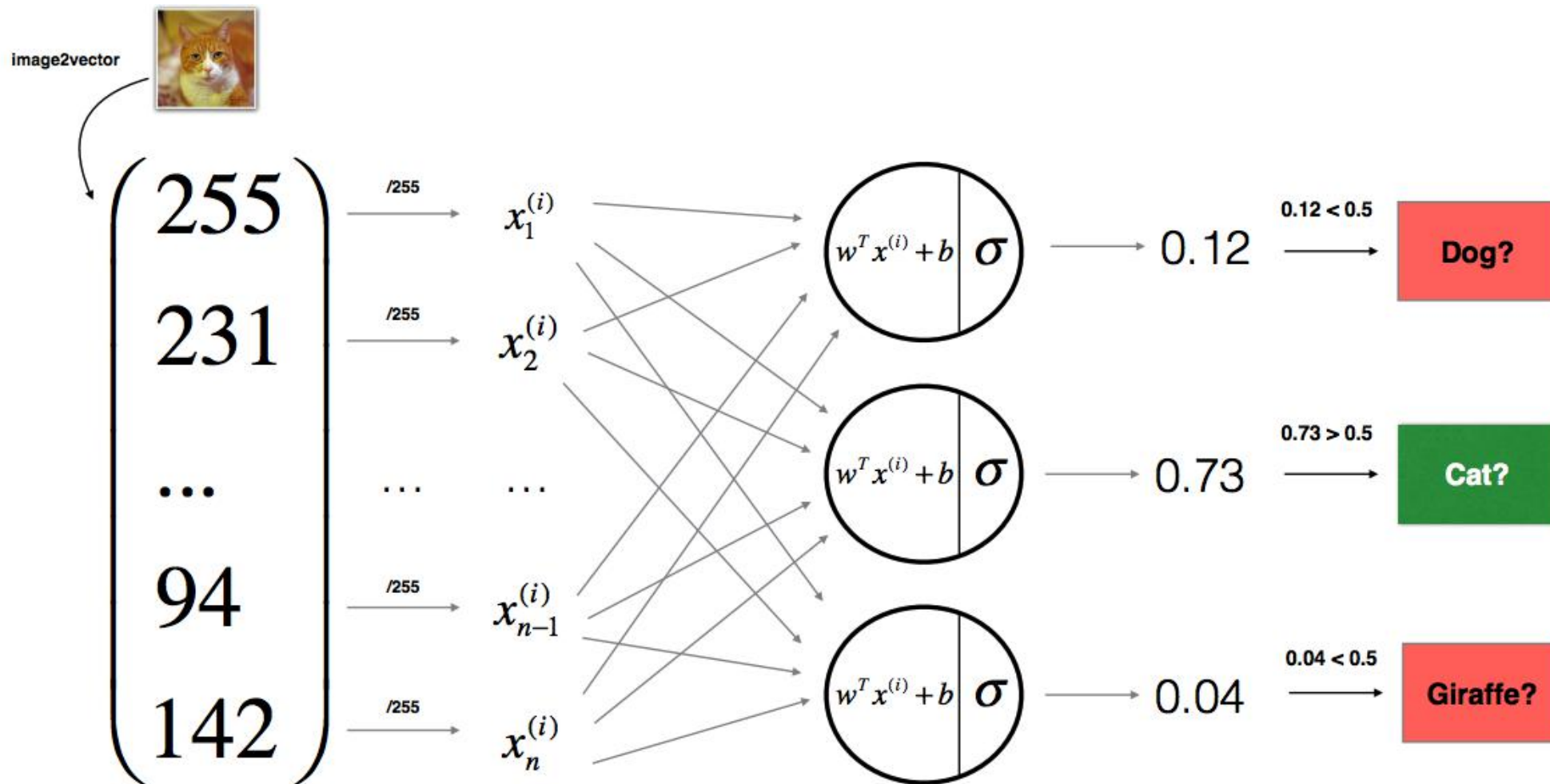
inference: solve argmax

modeling: define score **function**

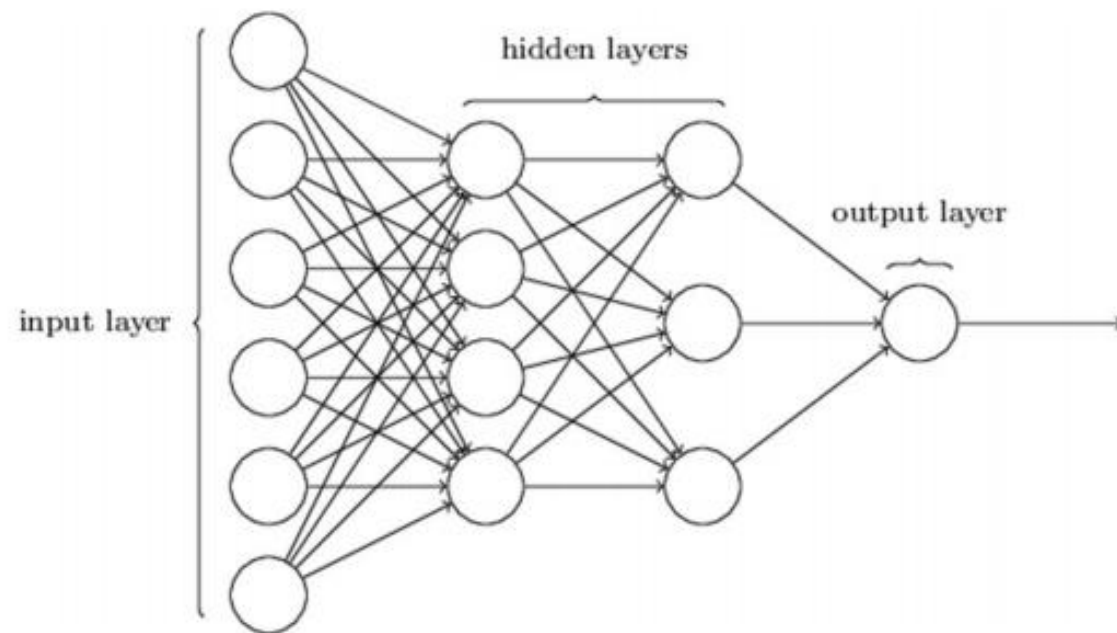
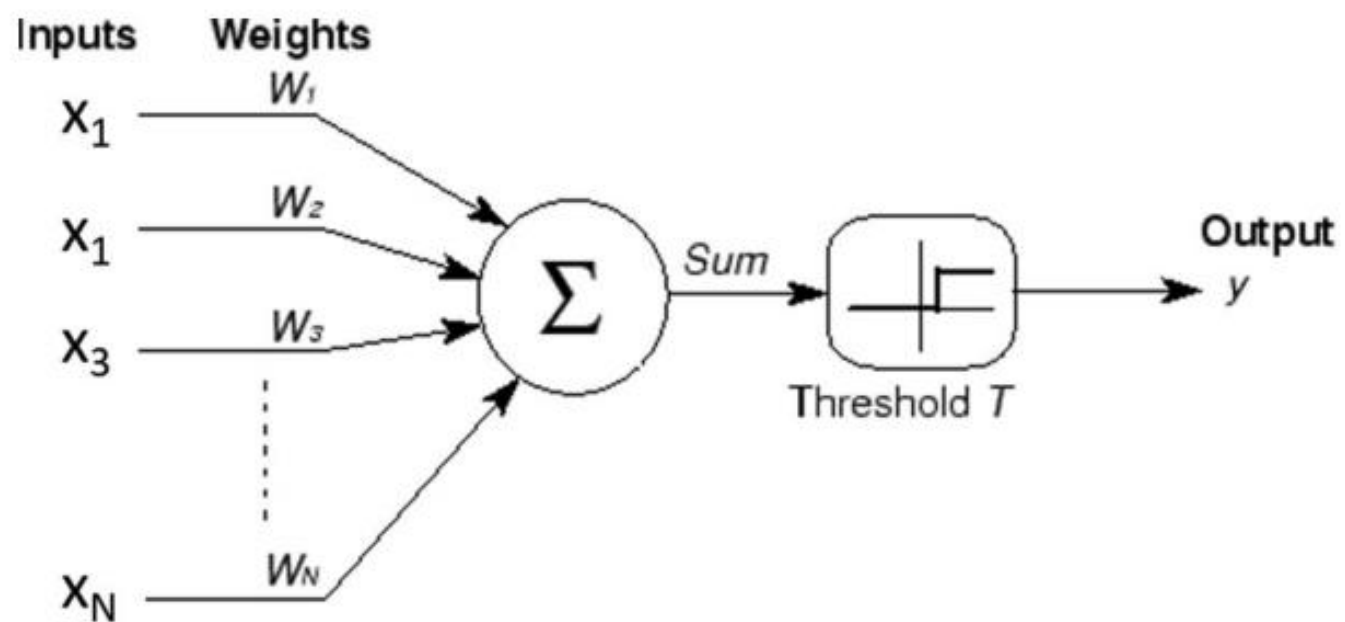
$$\operatorname{classify}(\boldsymbol{x}, \boldsymbol{w}) = \operatorname{argmax}_y \operatorname{score}(\boldsymbol{x}, y, \boldsymbol{w})$$

learning: choose \boldsymbol{w}

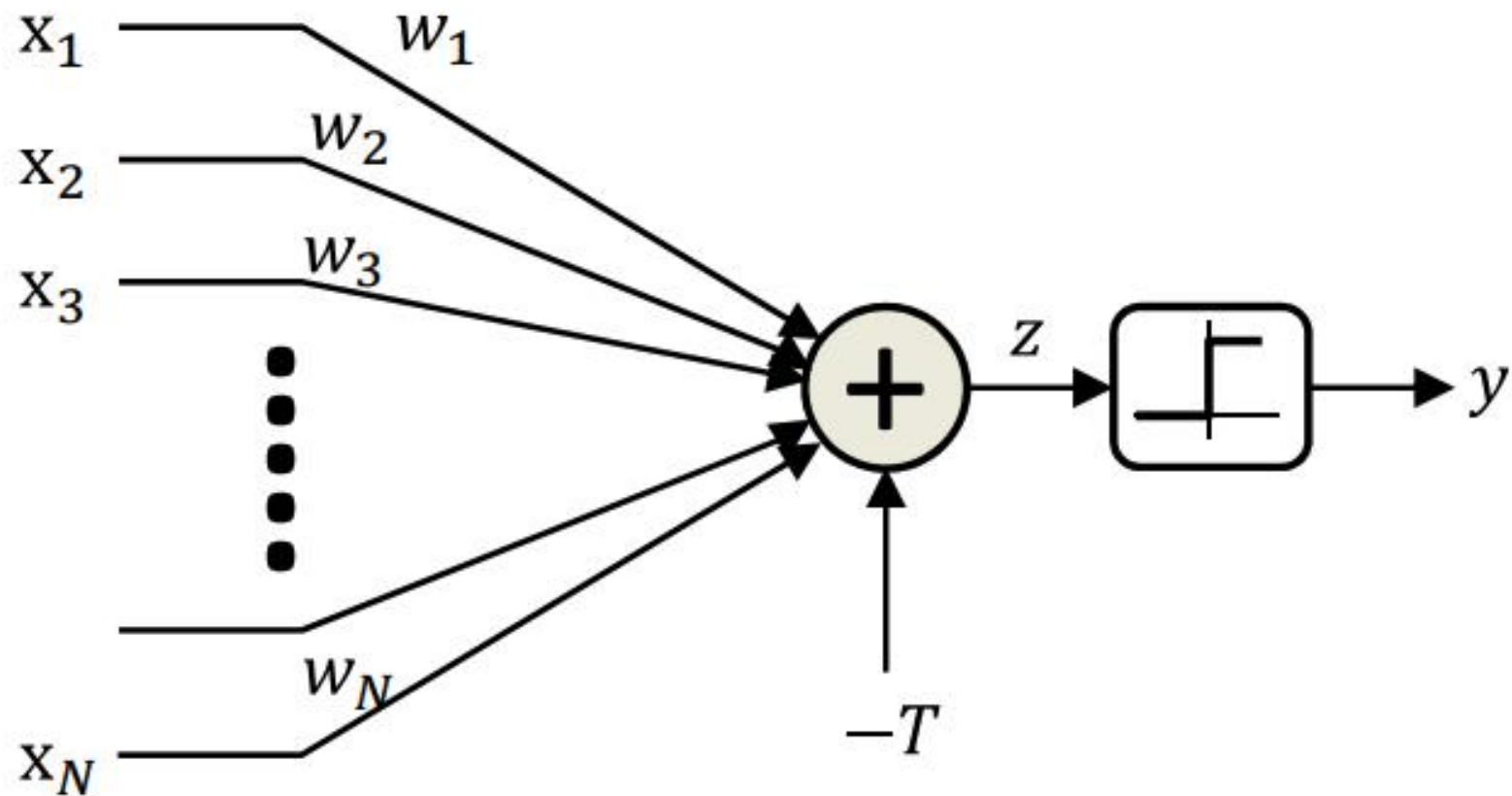
什么是深度学习?



什么是神经网络?



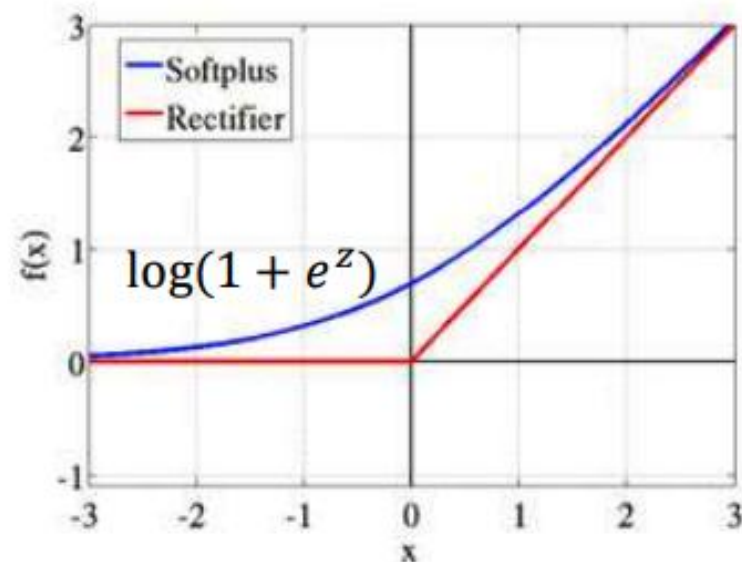
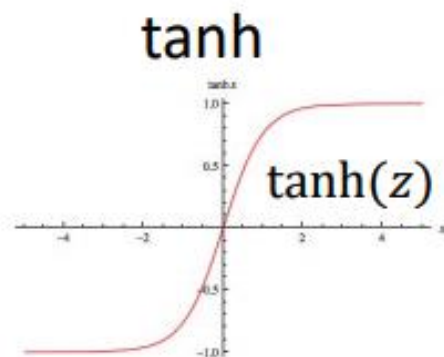
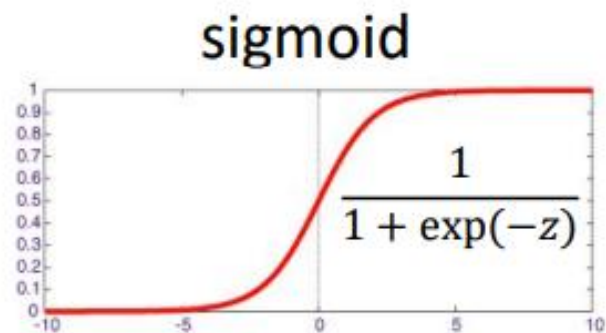
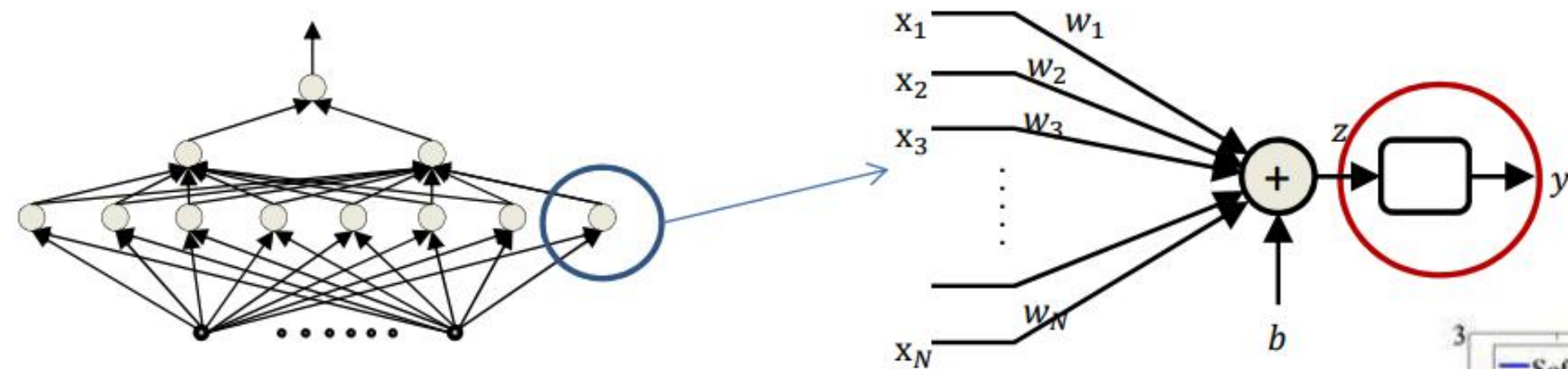
什么是神经网络?



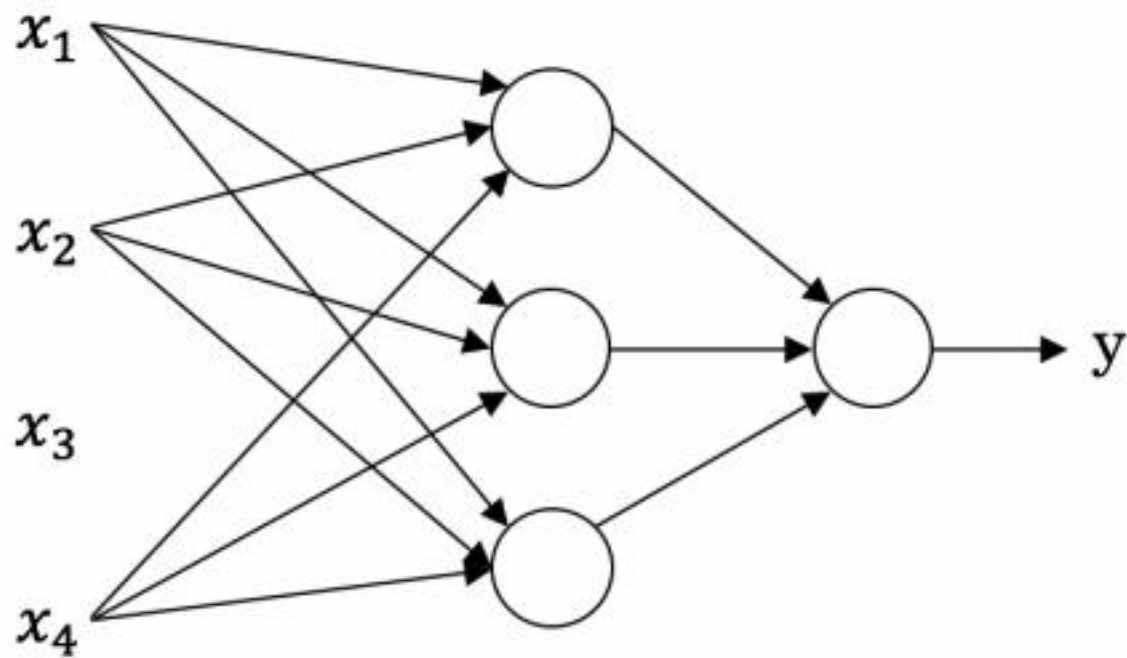
$$z = \sum_i w_i x_i - T$$

$$y = \begin{cases} 1 & \text{if } z \geq 0 \\ 0 & \text{else} \end{cases}$$

激活函数

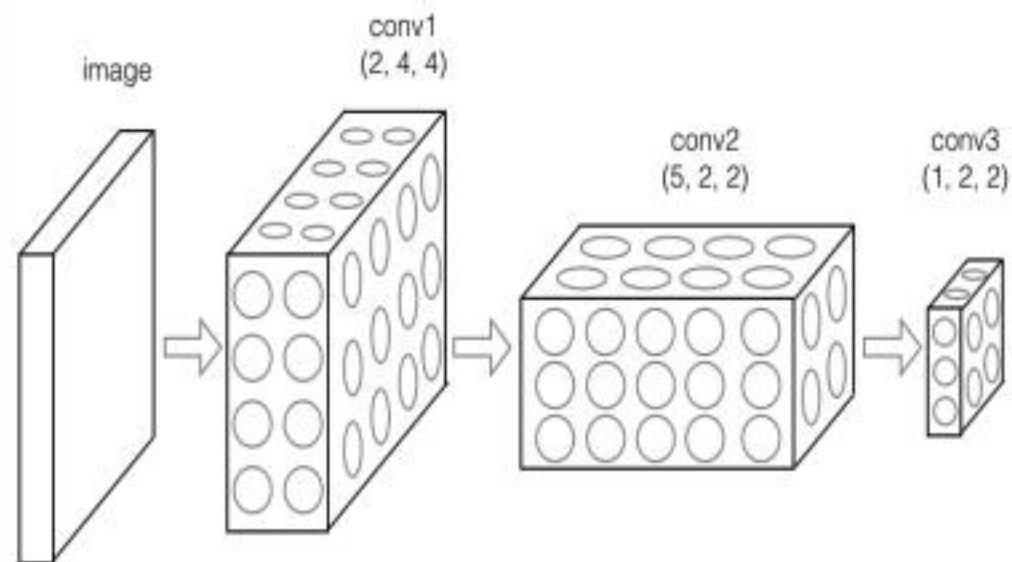


前向神经网络



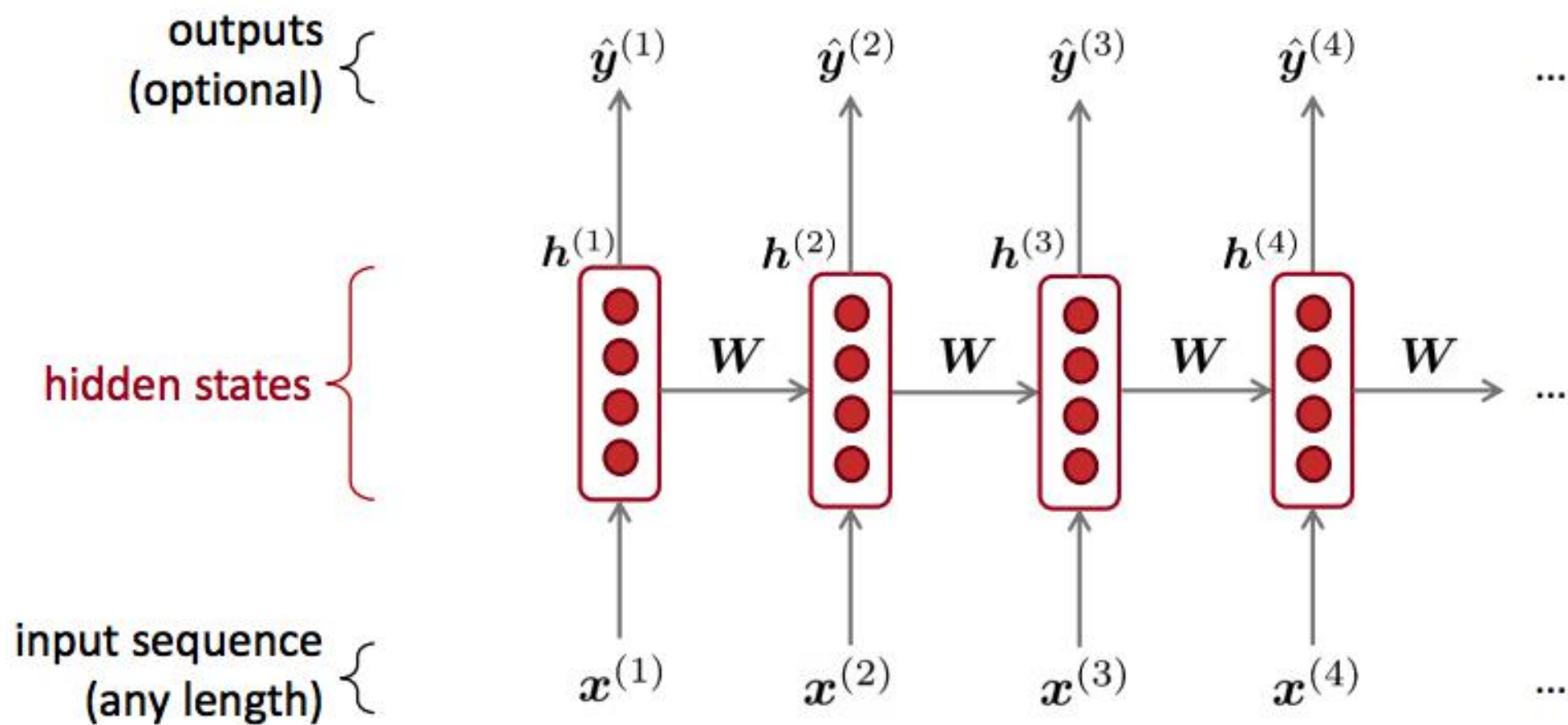
Standard NN

Convolutional NN



Convolutional NN

Recurrent Neural Networks





02

用PyTorch构建深度学习模型

Supporting text here.

When you copy & paste, choose "keep text only" option.

深度学习模型框架概览



dy/net



PyTorch与其他框架的对比

- PyTorch: 动态计算图 Dynamic Computation Graph
- Tensorflow: 静态计算图 Static Computation Graph
- PyTorch代码通俗易懂，非常接近Python原生代码，不会让人感觉是完全在学习一门新的语言。
- 拥有Facebook支持，社区活跃。



Andrej Karpathy 
@karpathy

Following



I've been using PyTorch a few months now and I've never felt better. I have more energy. My skin is clearer. My eye sight has improved.

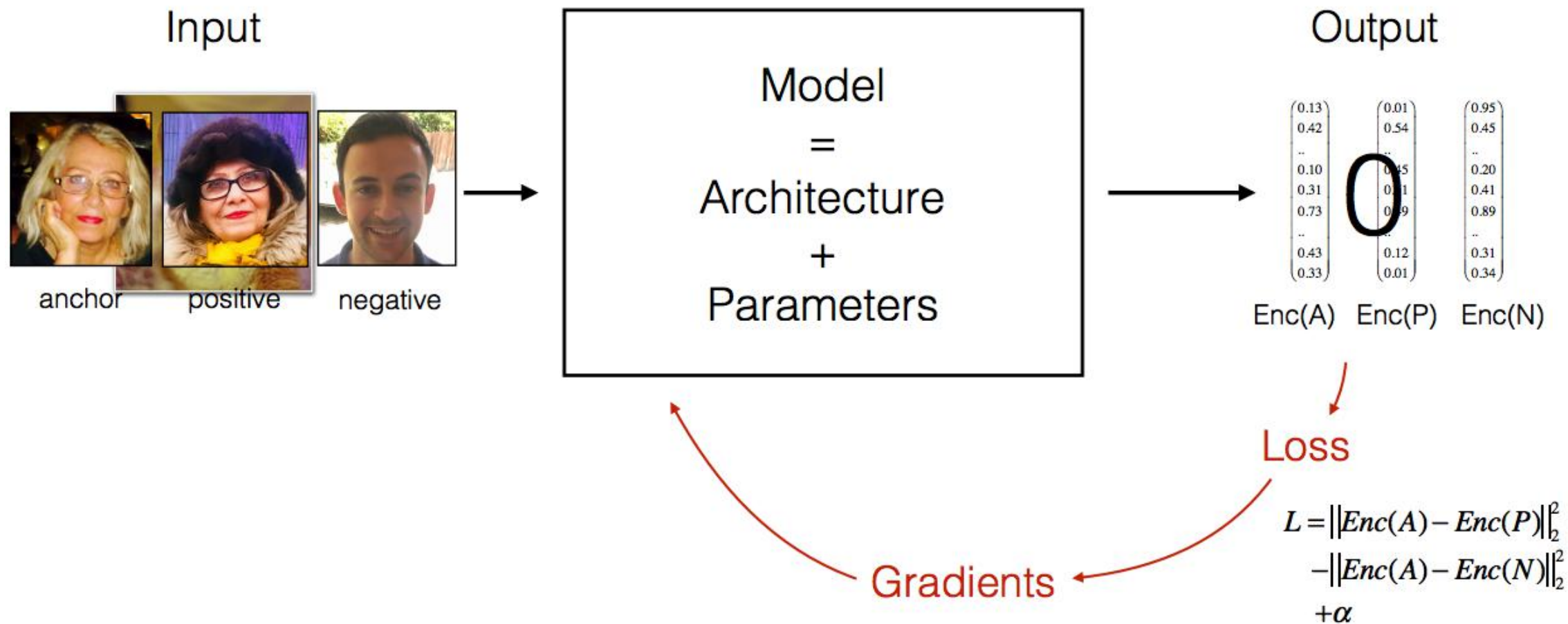
11:56 AM - 26 May 2017

351 Retweets 1,365 Likes



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PyTorch可以做什么?





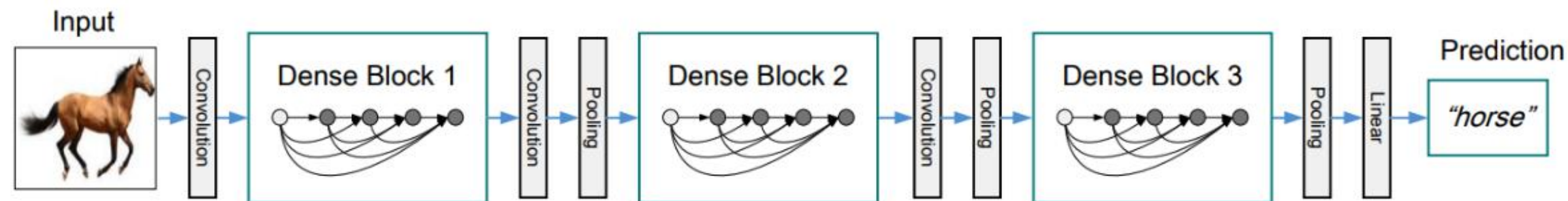
03

PyTorch精彩项目介绍

Supporting text here.

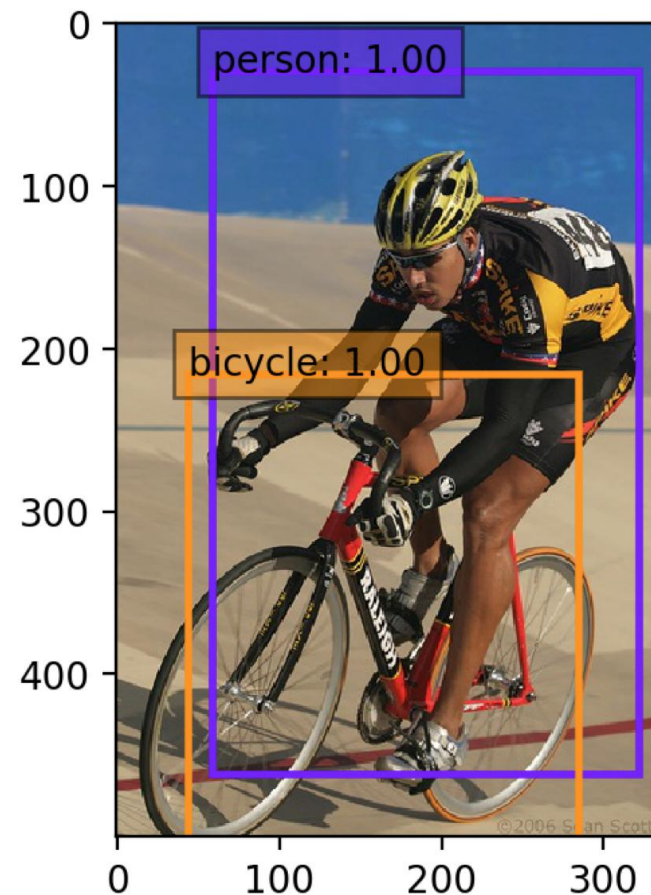
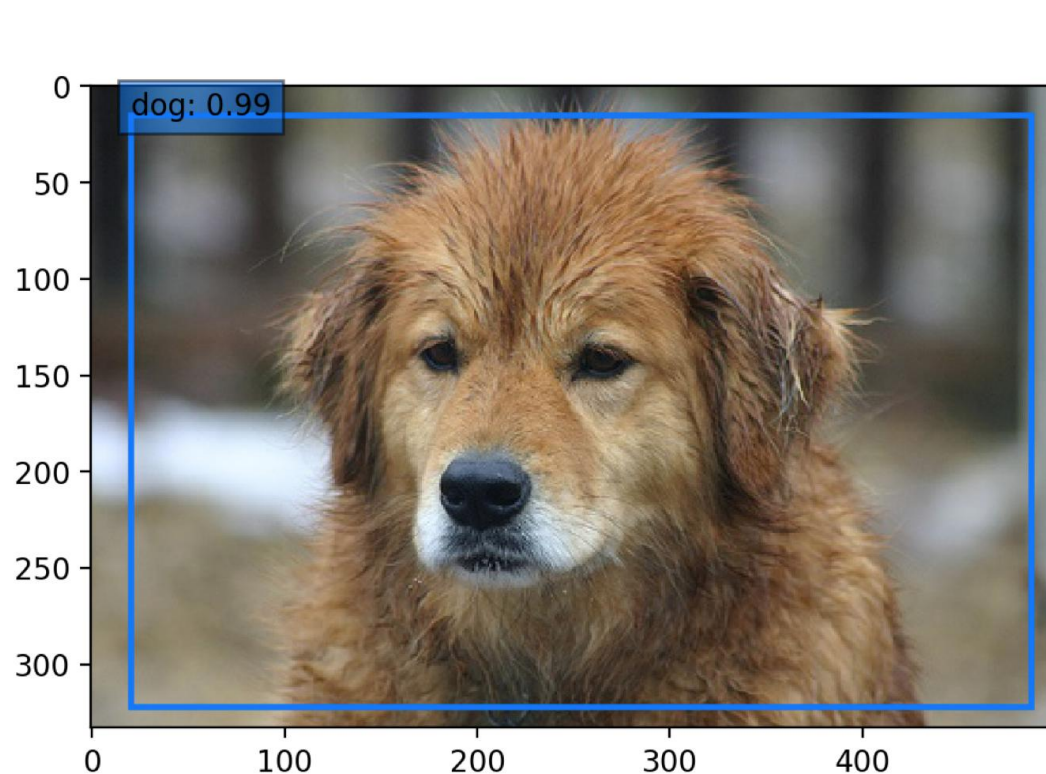
When you copy & paste, choose "keep text only" option.

图像分类



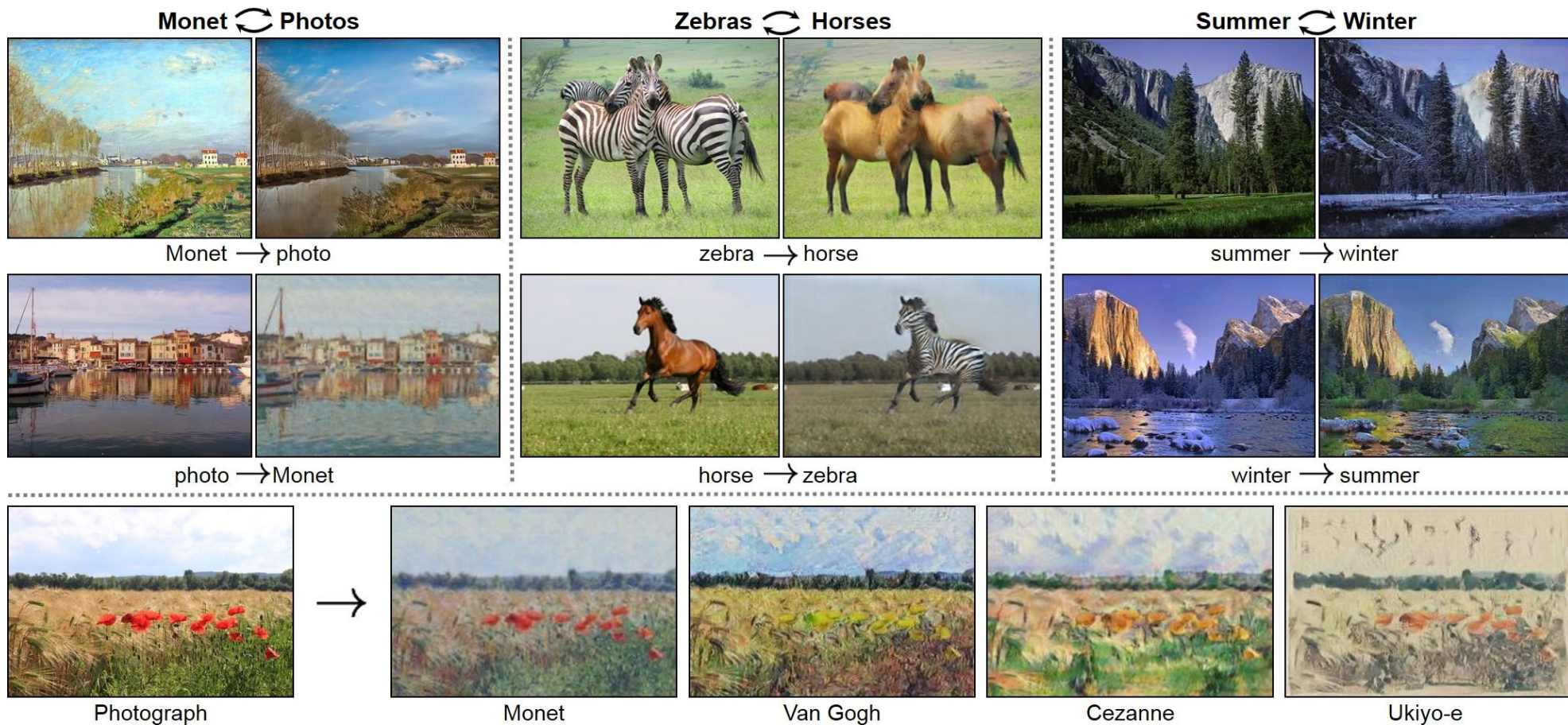
<https://github.com/floydhub/imagenet>

Object Detection



<https://github.com/amdegroot/ssd.pytorch>

CycleGAN



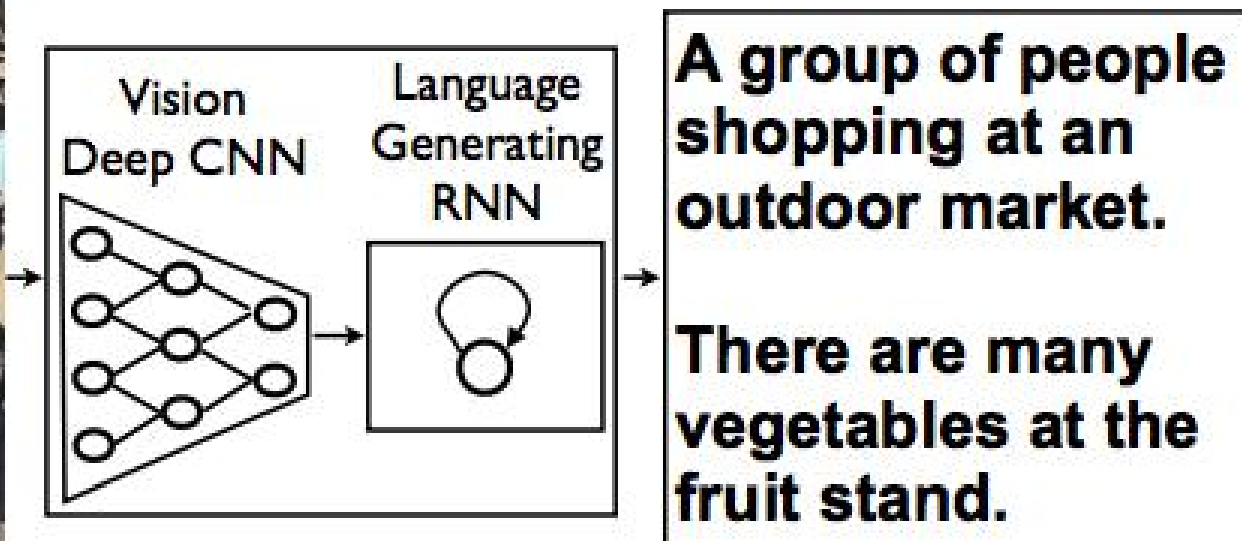
<https://github.com/junyanz/pytorch-CycleGAN-and-pix2pix>

Image Style Transfer



<https://github.com/zhanghang1989/PyTorch-Multi-Style-Transfer>

Image Captioning



<https://github.com/ruotianluo/ImageCaptioning.pytorch>

情感分析

An example negative review...

```
predict_sentiment("This film is terrible")
```

```
0.05760132521390915
```

An example positive review...

```
predict_sentiment("This film is great")
```

```
0.9212645292282104
```

<https://github.com/bentrevelt/pytorch-sentiment-analysis>

Question Answering

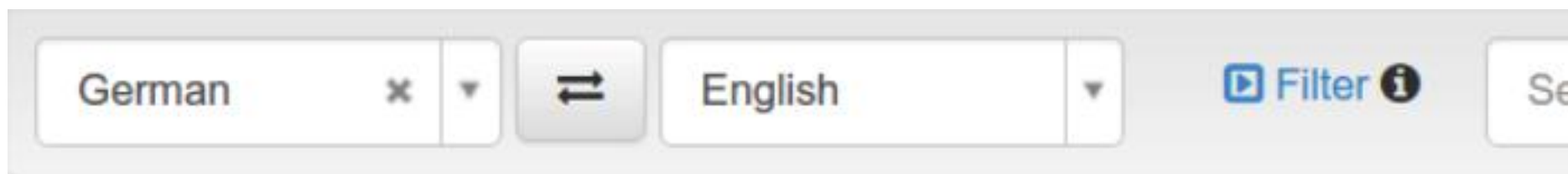
Question: Which British general was killed at Khartoum in 1885?

Answer: Gordon

Context: In February 1885 **Gordon** returned to the Sudan to evacuate Egyptian forces. Khartoum came under siege the next month and rebels broke into the city, killing **Gordon** and the other defenders. The British public reacted to his death by acclaiming ‘**Gordon** of Khartoum’, a saint. However, historians have suggested that **Gordon** defied orders and refused to evacuate...

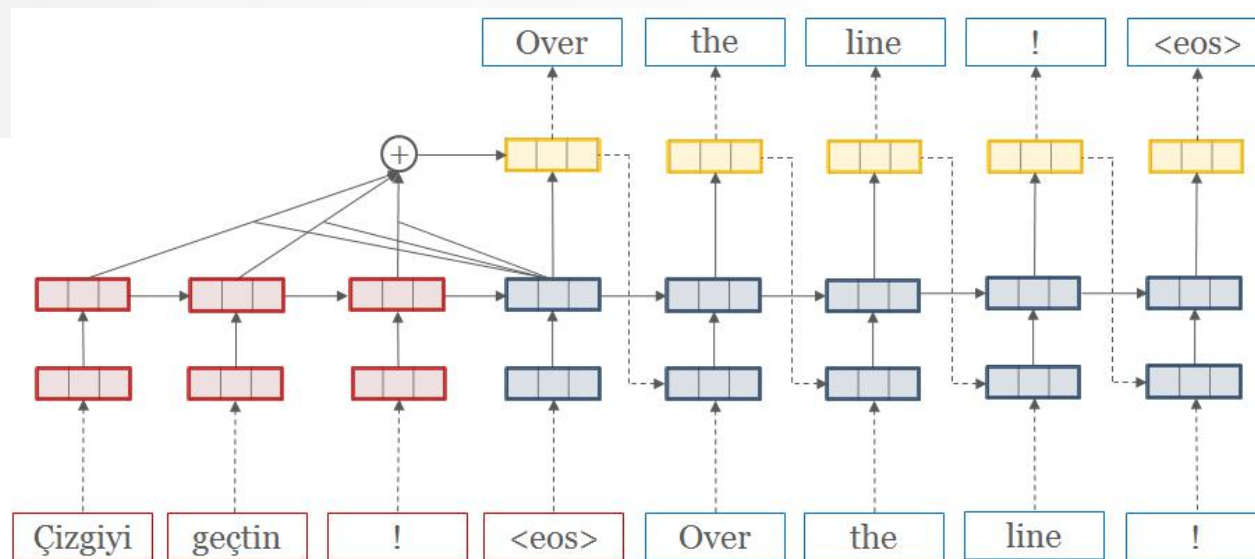
<https://github.com/allenai/document-qa>

Translation: OpenNMT-py



Verstehen Sie?

Do you understand?



<https://github.com/OpenNMT/OpenNMT-py>

ChatBot

```
me: what's your name ?  
Bot: my name is sam . score:-0.46  
Bot: my name is mona white . score:-0.53  
Bot: my name is james . score:-0.57  
Bot: my name is zhuang lingy . how are you , miss kelly ? score:-0.57  
Bot: my name is zhuang lingy . how are you ? score:-0.61  
  
me: how old are you ?  
Bot: i am twenty-five years old . score:-0.85  
Bot: i am not sure . what about you ? score:-0.89  
Bot: i am going to have a picnic with my friends . score:-0.96  
Bot: i am going to buy a birthday party for you . score:-0.97  
Bot: 5 years old . score:-0.98
```

<https://github.com/czs0x55aa/pytorch-chatbot>

Deep Reinforcement Learning

<https://github.com/jingweiz/pytorch-rl>

https://pytorch.org/tutorials/intermediate/reinforcement_q_learning.html

如何成为PyTorch大神？

- 学好深度学习的基础知识
 - 学习PyTorch官方tutorial
 - 学习GitHub以及各种博客上的教程(别人创建好的list)
 - 阅读documentation, 使用论坛<https://discuss.pytorch.org/>
 - 跑通以及学习开源PyTorch项目
 - 阅读深度学习模型paper, 学习别人的模型实现
 - 通过阅读paper, 自己实现模型
 - 自己创造模型(也可以写paper)
-
- 报名七月在线PyTorch课程 <https://www.julyedu.com/course/getDetail/140/>



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