Introdution

1. Convolutional Neural Network

2. Recurrent Neural Network

- LSTM (Hochreiter & Schmidhuber. 1997)
- Variants on LSTM
- GRU (Cho, et al. 2014)
- Attention and Memory (RAM NIPS Workshop) [6]

3. Recursive Neural Network

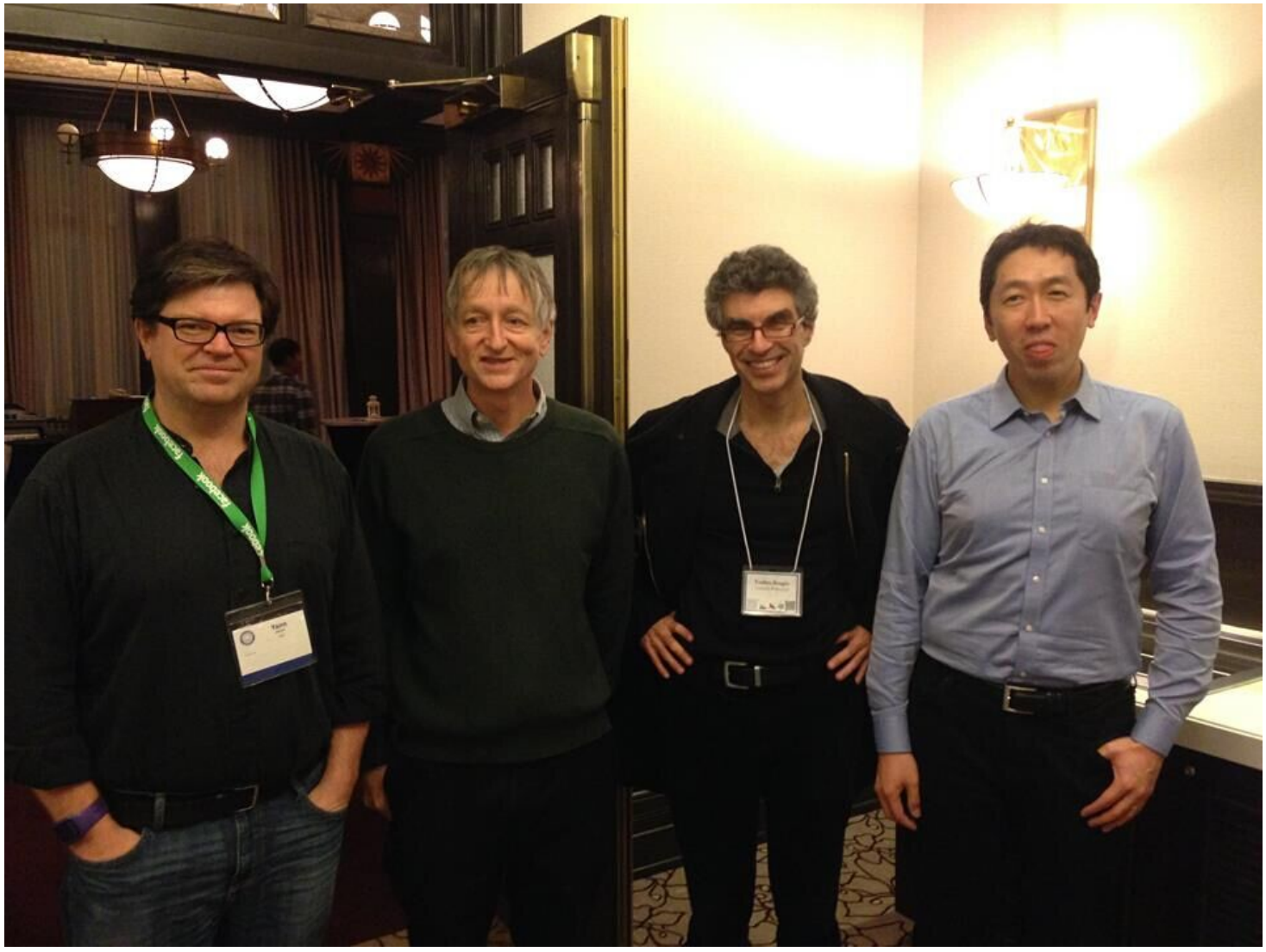
4. optimization [7, 8]

- SGD
- Momentum (1999)
- Adagrad (2011)
- Adadelta (2012)
- RMSProp (2012)
- Adam (2015)

5. library

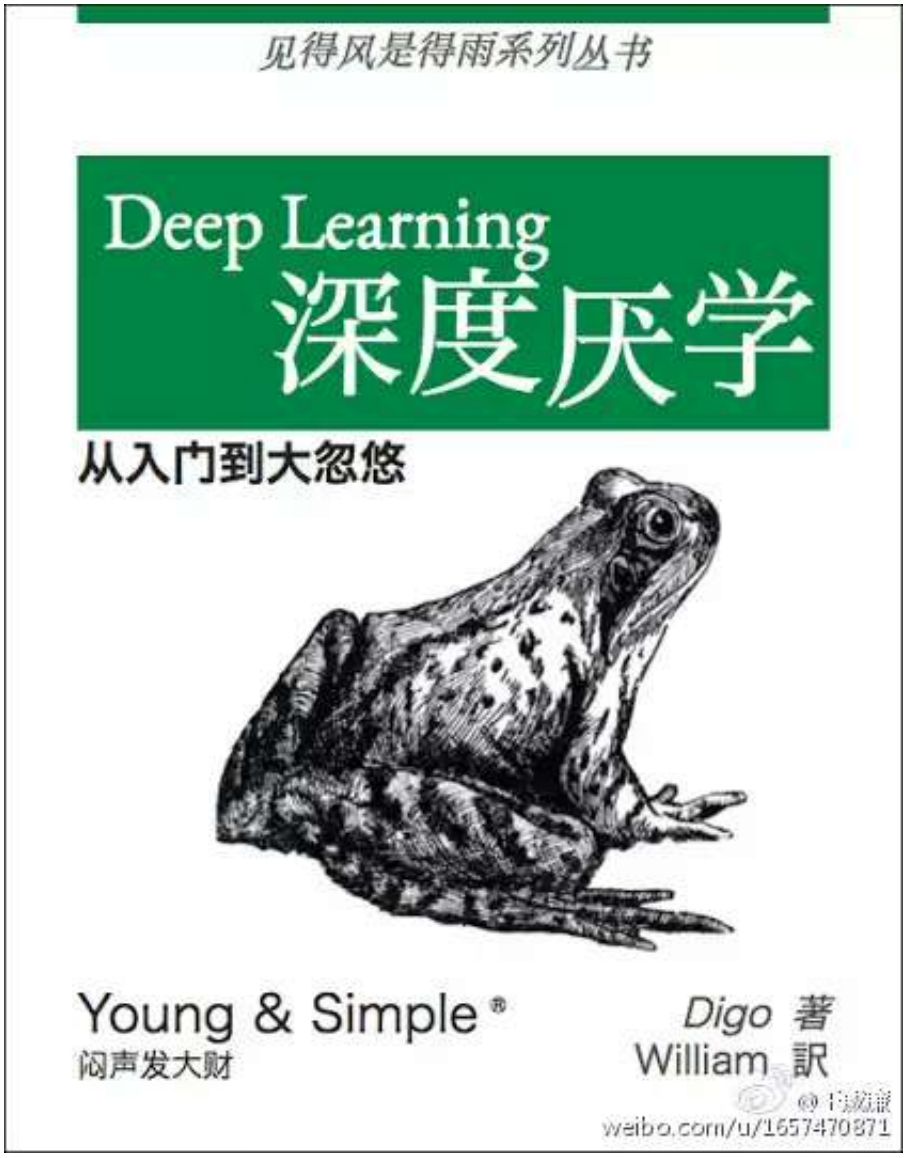
- Theano [9]
- Torch [10]
- TensorFlow [11]
- Caffe [12]

6. Big Four



Yann Lecun, Geoffrey Hinton, Yoshua Bengio, Andrew Ng

7. … …



Deep Learning

Reference

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3. **神经网络和深度学习简史(二)**: http://www.almosthuman.cn/2016/01/27/tytne/
4. **神经网络和深度学习简史(三)**: http://www.almosthuman.cn/2016/02/02/bbtsz/
5. **神经网络和深度学习简史(四)**: http://www.almosthuman.cn/2016/02/28/13jpp/
6. **Reasoning, Attention, Memory (RAM) NIPS Workshop 2015**: http://www.thespermwhale.com/jaseweston/ram/
7. **An overview of gradient descent optimization algorithms**: http://sebastianruder.com/optimizing-gradient-descent/
8. **Optimization for Training DeepModels (Deep Learning Book)**:

   http://www.deeplearningbook.org/contents/optimization.html
9. **Theano**: http://deeplearning.net/software/theano/
10. **Torch**: http://torch.ch/
11. **TensorFlow**: https://www.tensorflow.org/
12. **Caffe**: http://caffe.berkeleyvision.org/