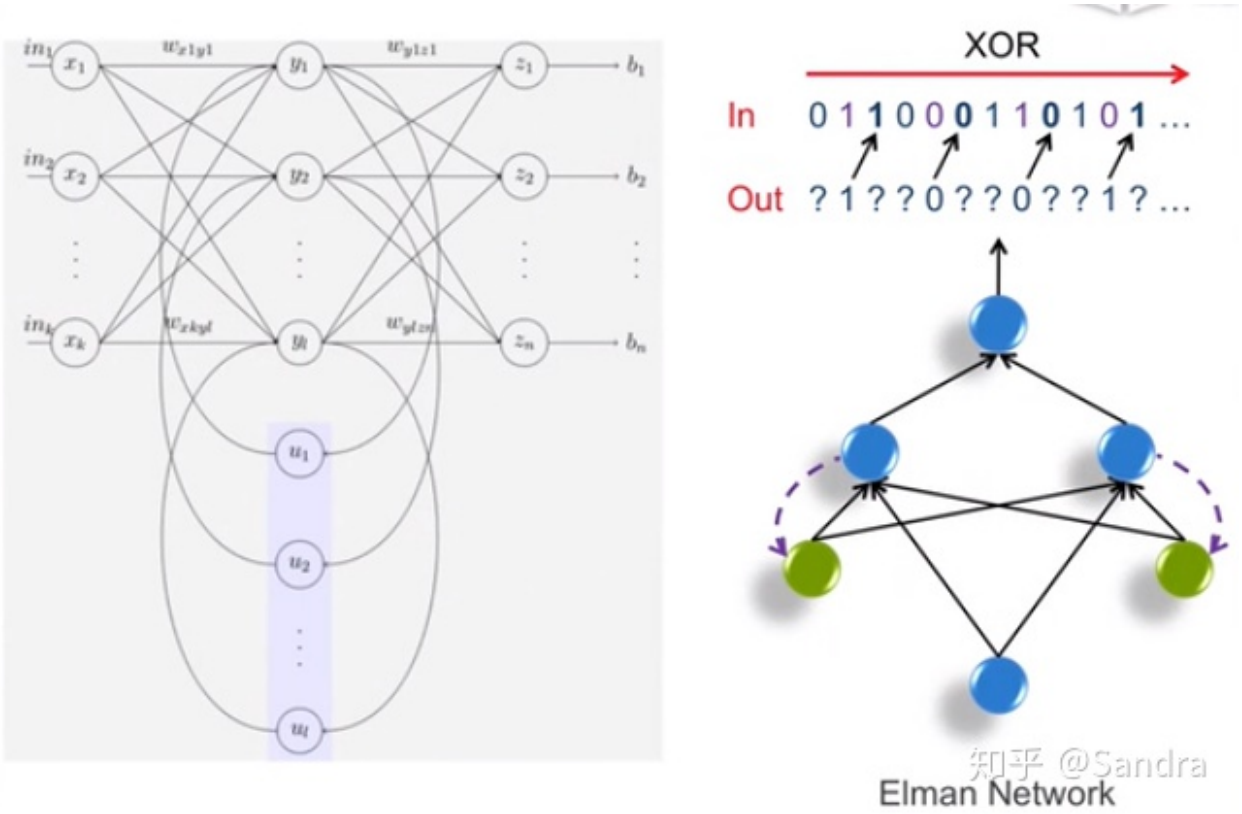
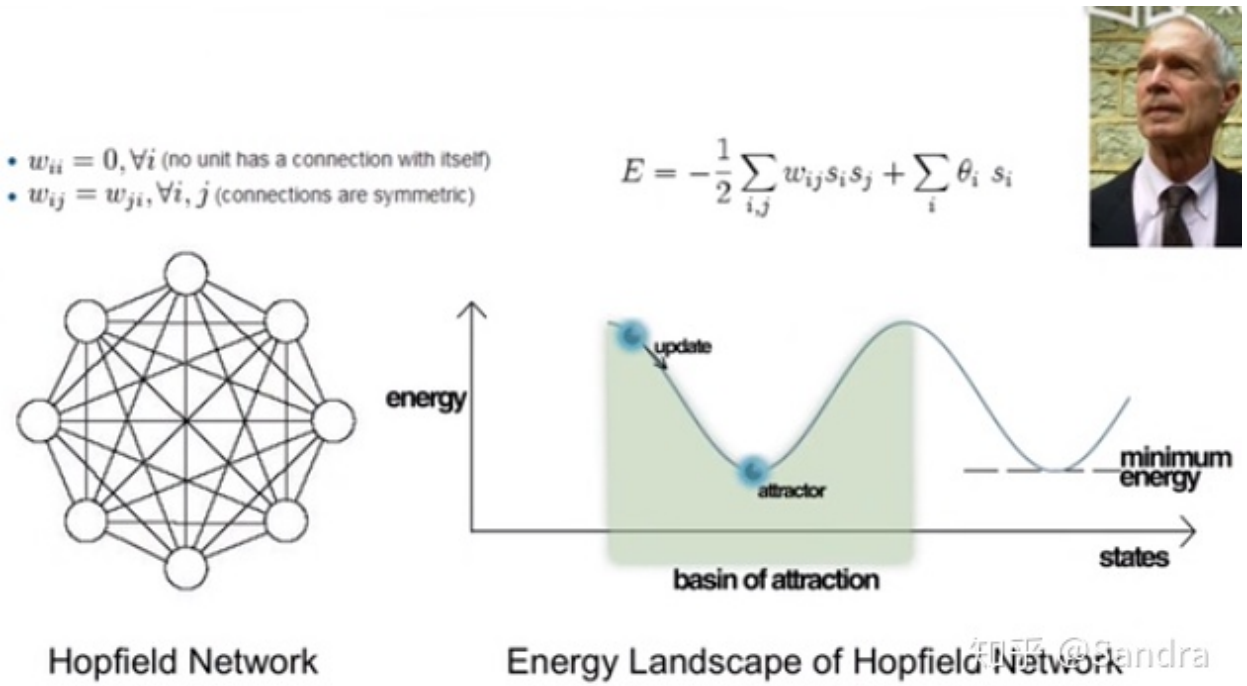
有特点的神经网络：



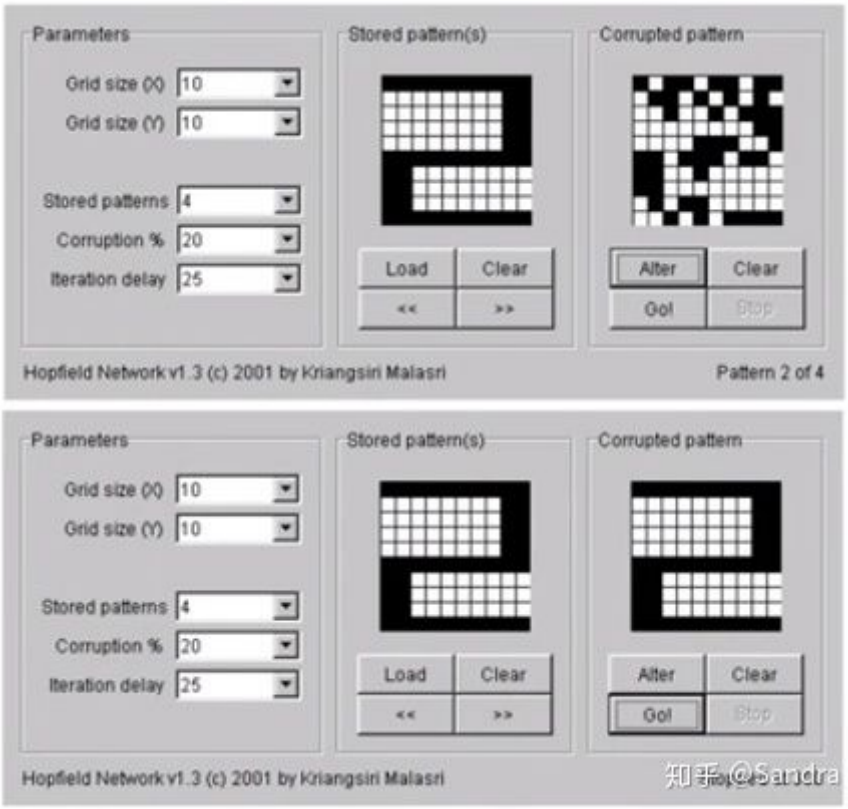
一个输入，有顺序的输入，有上下的关系（前两个决定第三个，要有记忆——紫色尖头代表的，copy，将数据反馈回来）

全互联网络（说不出输出输入的点），没有层次性的概念（有模式记忆性，有容量限制，很接近与人的大脑）：



首次可能直接在最低点，第二次慢慢收敛至最低点，并将最低点的值取出——联想记忆（找到与其最接近的点）

例子：



神经网络的注意点：

- Instances are represented by attribute-value pairs.
  - Input values can be any real values.
- The target output may be discrete-valued, real-valued, or a vector of several real- or discrete-valued attributes.
- The training samples may contain errors.
- Long training times are acceptable.
  - Can range from a few seconds to several hours.
- Fast evaluation of the learned target function may be required.
- The ability to understand the learned function is not important.
  - Weights are difficult for humans to interpret.

训练时间较长，用起来较快

与决策树相比，准确度较高，可解释性较差（复杂网络的权重、节点等较难解释）

参考文献：

Text Book

- R. O. Duda et al., *Pattern Classification,* Chapter 6, John Wiley & Sons Inc.
- Tom Mitchell, *Machine Learning,* Chapter 4, McGraw-Hill.
- http://page.mi.fu-berlin.de/rojas/neural/index.html.html

Online Demo

- http://neuron.eng.wayne.edu/software.html
- http://facstaff.cbu.edu/~pong/ai/hopfield/hopfieldapplet.html

Online Tutorial

- http://www.autonlab.org/tutorials/neural13.pdf
- http://www.cs.cmu.edu/afs/cs.cmu.edu/user/mitchell/ftp/faces.html