Draft 1

Neural Networks and Deep Learning

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PART 1

Outline

• Artificial Neurons • ANN Learning • Multi-Layer NN • NN in Action • CNN

Organic Neural Network

• The human brain has about 1011 neurons • Switching time 0.001s (computer $\approx$ 10-10s) • Connections per neuron: 104 – 105 • 0.1s for face recognition! • Strengths: Parallelism and distributedness

Biological Neurons

• Dendrit receives information input in the form of electric signals,

accumulated in soma.

• When the information accumulation has reached some threshold,

the neuron will fire the information output to be transmitted through axon

• Axon is connected to dendrit in other neurons

through synapses

• Learning is done through synaptical weight

adaptation.

ANN: Basic Idea