



DL SG – Week 1: ***Deep Learning Introduction***

Thuong Nguyen Canh

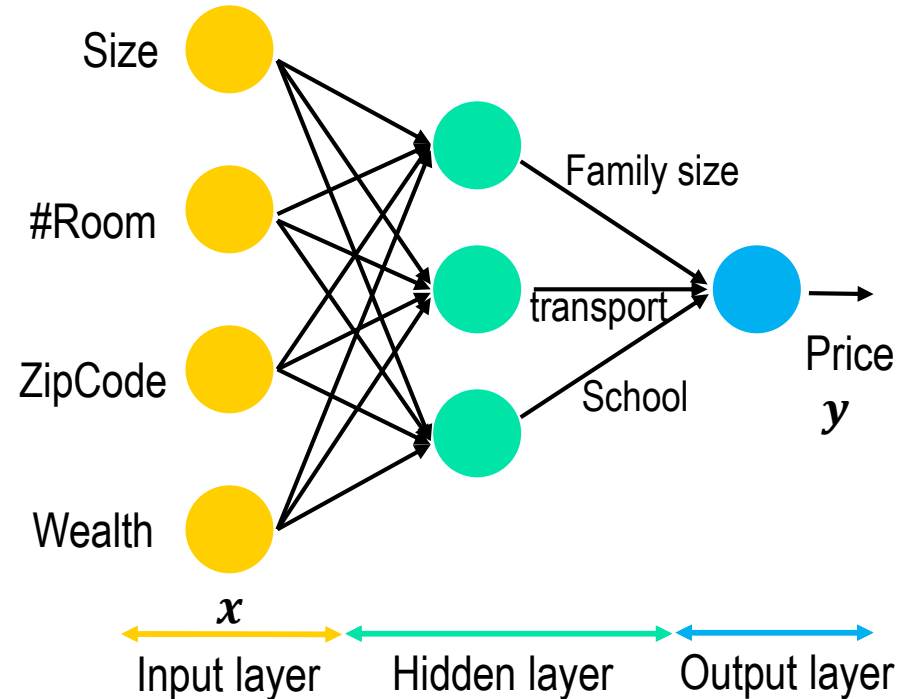
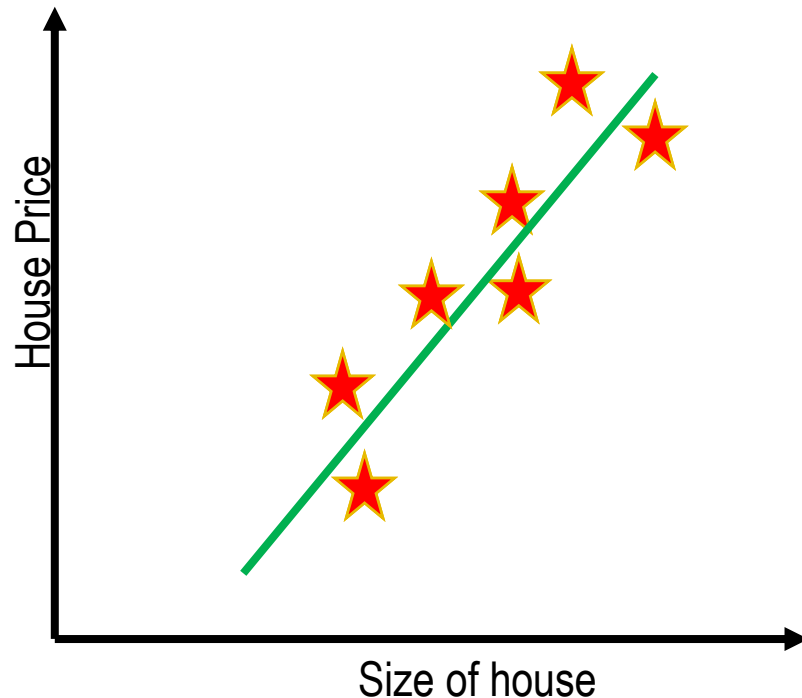
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Note: This material is based on the Deep Learning Specialization Course by Andrew Ng, Coursera

Neural Network

House price prediction



- Neural network is a stack of directional connected neurons, which take *input* and learn *hidden* neuron to predict the *output*
- Given enough training pair (x, y) , neural network can predict at high accuracy

Supervised Learning

Supervised Learning learns a mapping function from the past experience (paired data).

Classification

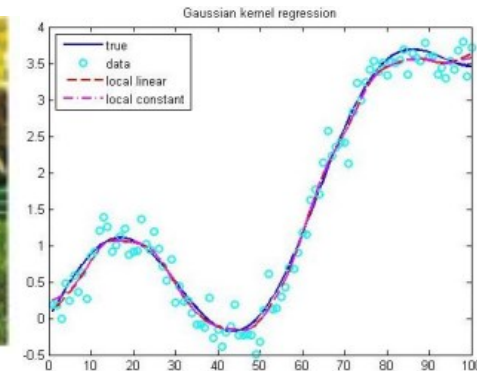
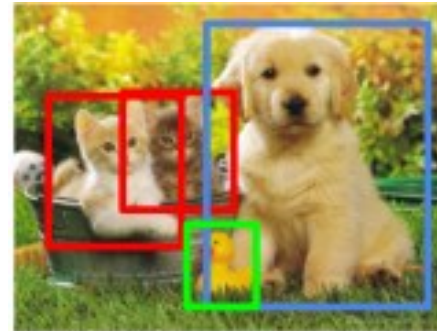
- Discrete target value
- Entropy loss
- Label: pixels \rightarrow number
- Learn decision making



CAT

Regression

- Real/interval target value
- Mean square error loss
- Label: $x \rightarrow y$
- Learn predict an outcome



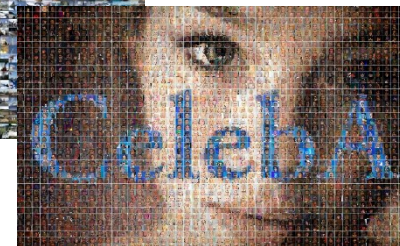
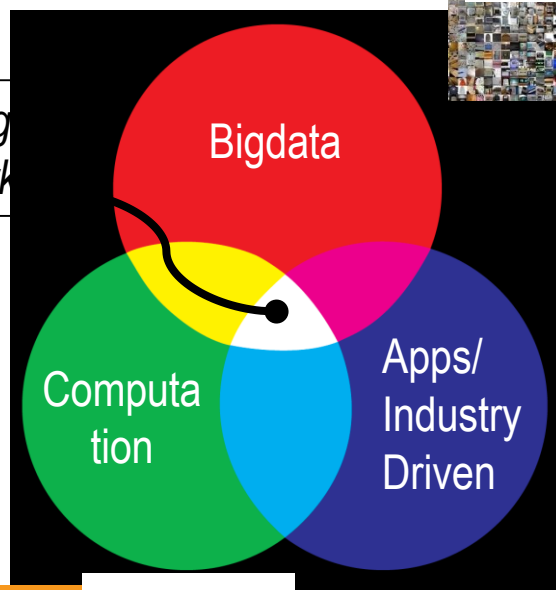
Unstructured data

Structured data

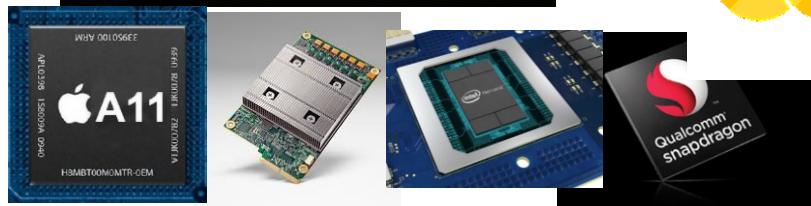
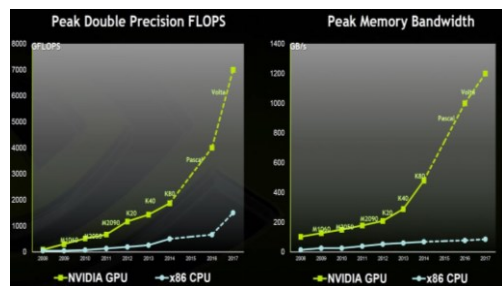
Why Deep Learning Took Off?

- Achieves the best performance in many tasks (classification, restoration, etc.)
 - Complex training but simple testing phase

Deep Learning
(Neural Network)



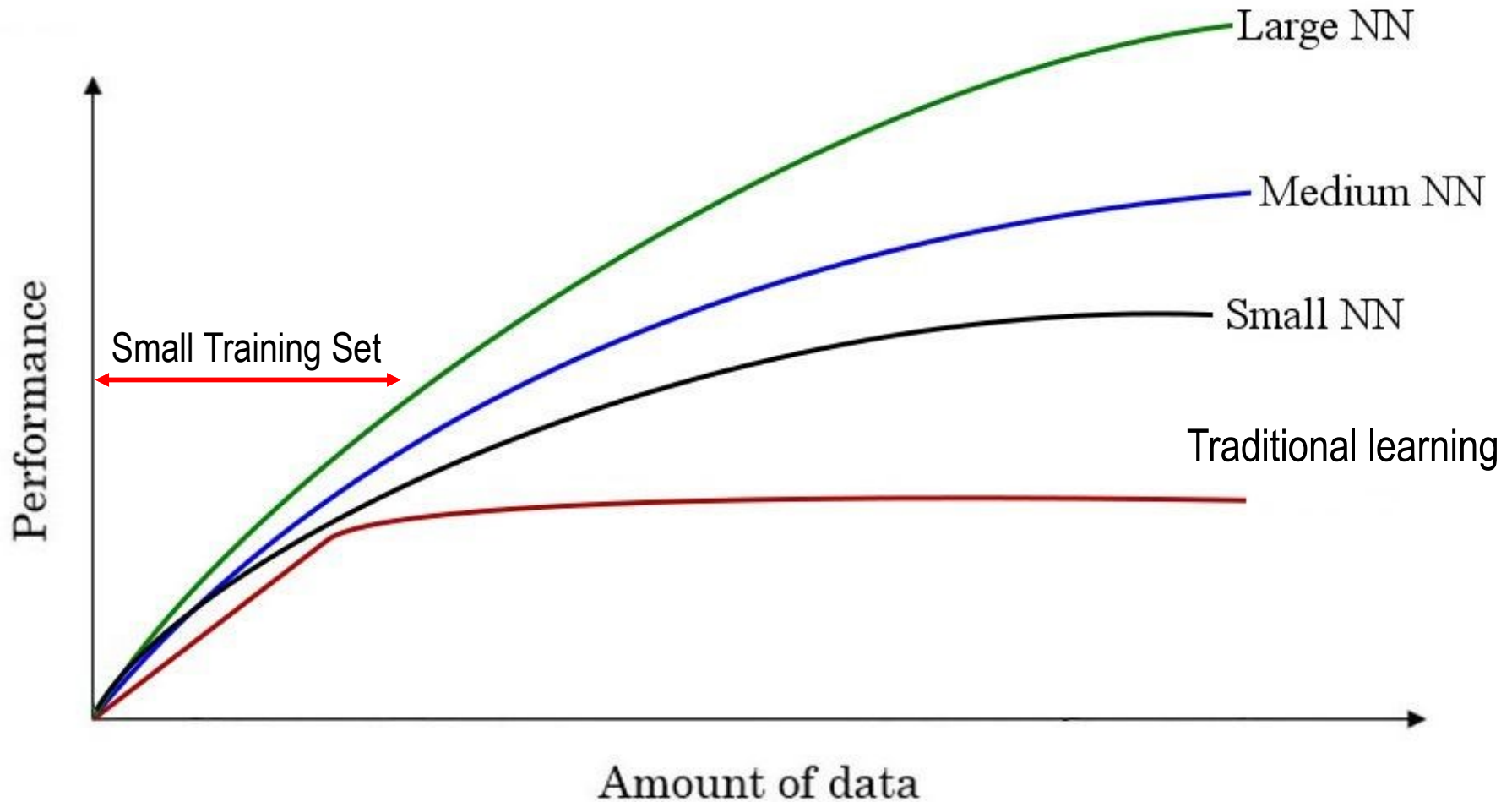
Computing power increases dramatically



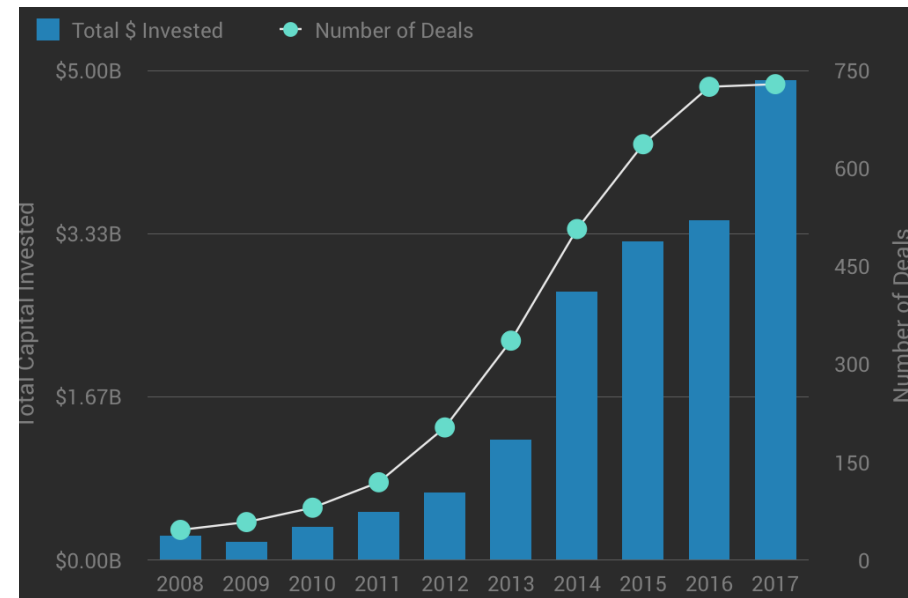
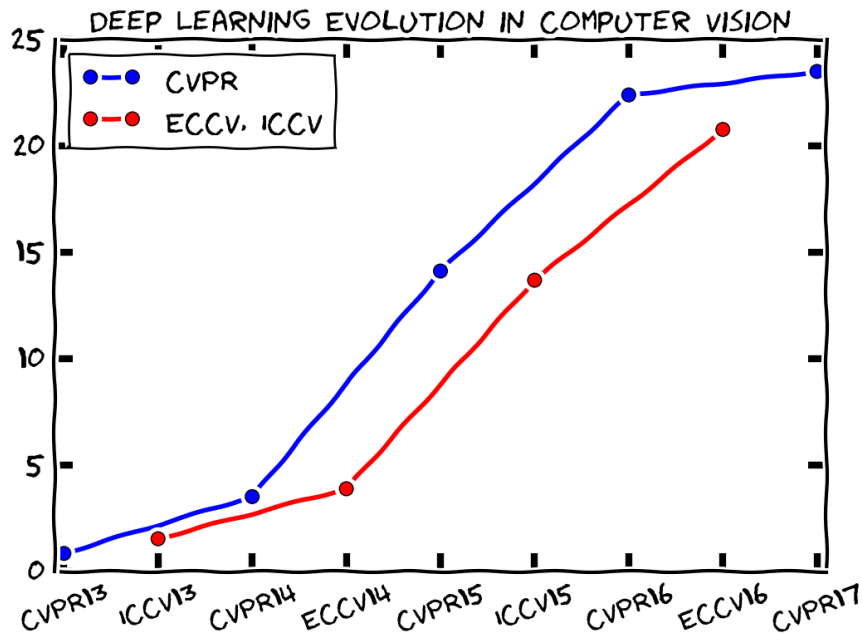
Shaping the industry/consumer products



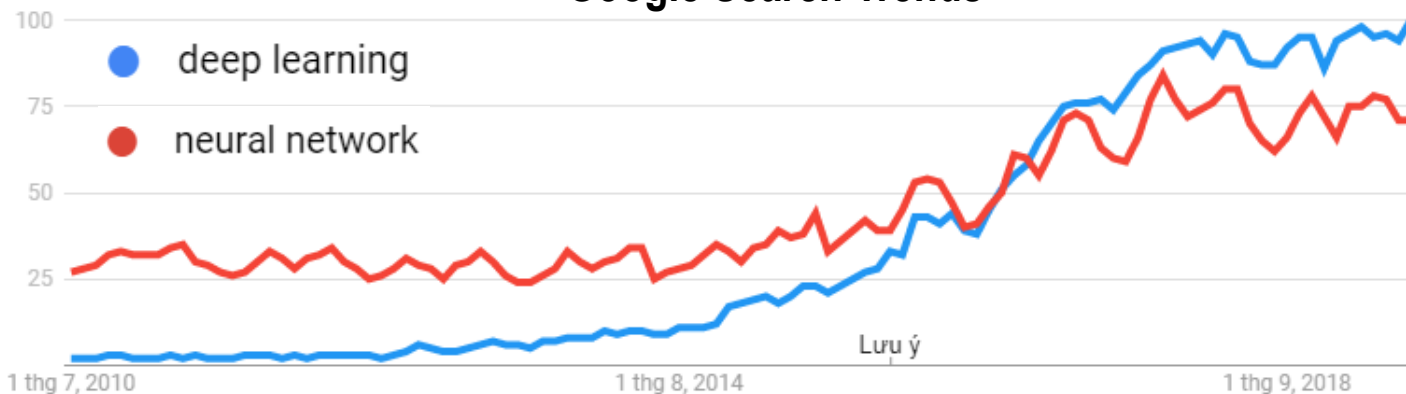
Why Deep Learning Took Off?



Deep Learning in Action

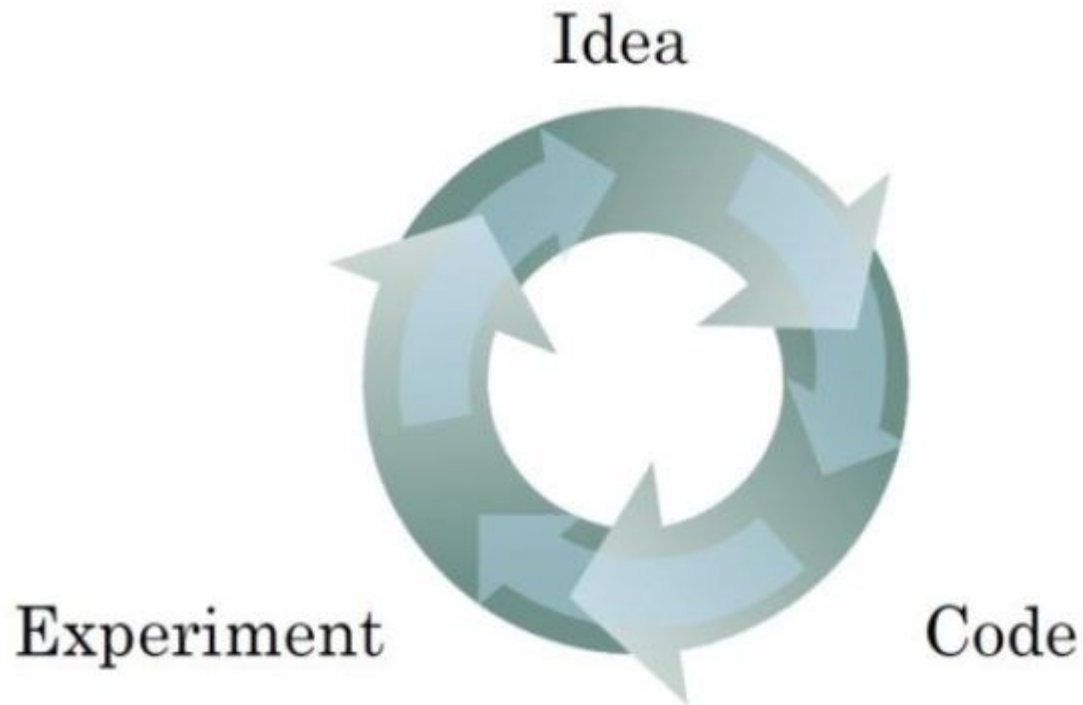


Google Search Trends



Deep Learning Process

• Data + Computation + Algorithm



Faster cycling, better algorithm, better results

