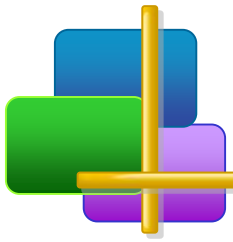


DLSG – Week 1: Deep Learning Introduction

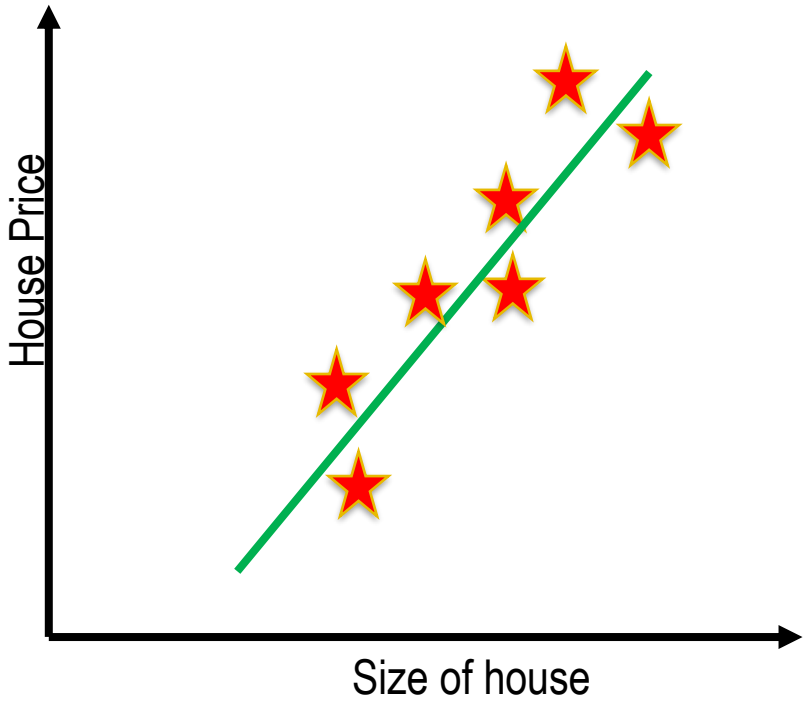
Thuong Nguyen Canh

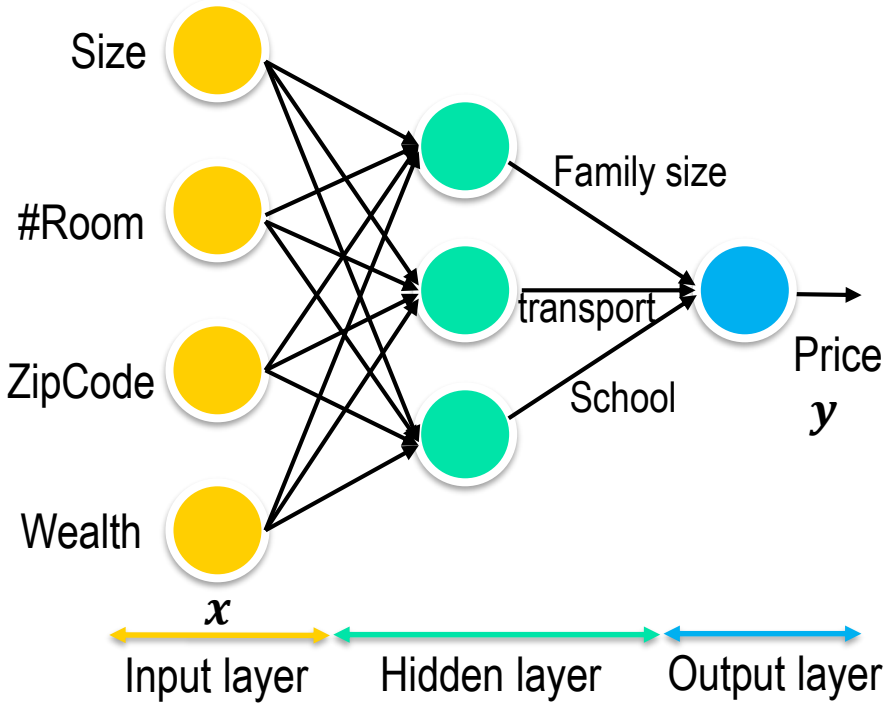
July 2019

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

Neural Network

- House price prediction



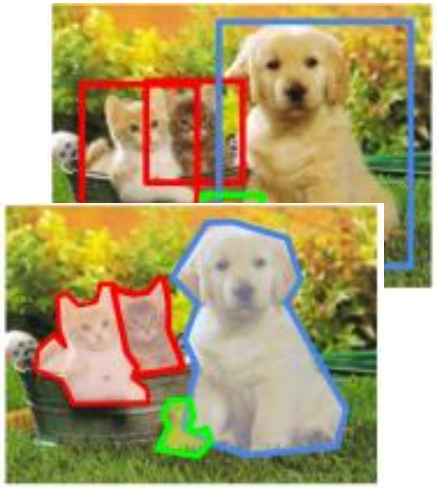


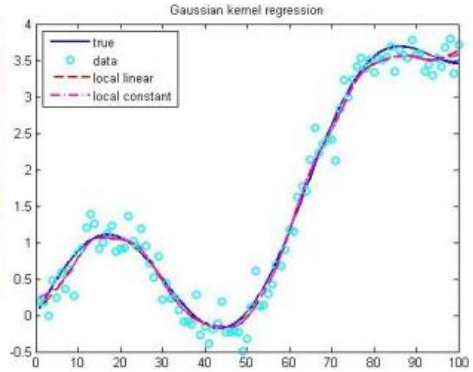
- Neural network is a stack of directional connected neurons, which take *input* and learn *hidden* neuron to predict the *output*
- Given enough training pair (x, y), neural network can predict at high accuracy

Supervised Learning

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

- Classification
  - Discrete target value
  - Entropy loss
  - Label: pixels → number
  - Learn decision making
- Regression
  - Real/interval target value
  - Mean square error loss
  - Label: x → y
  - Learn predict an outcome





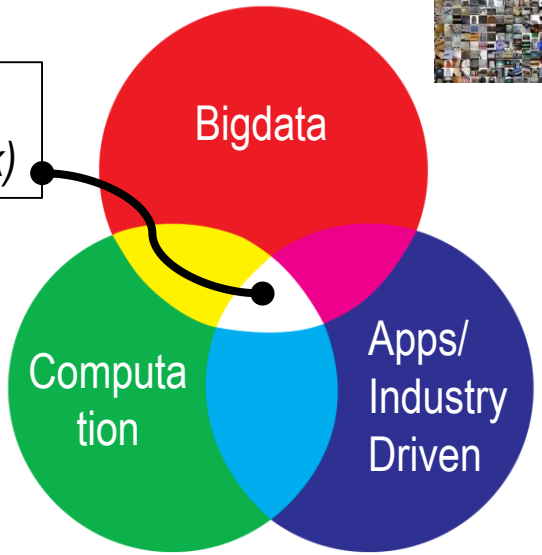
Unstructured data

Structured data

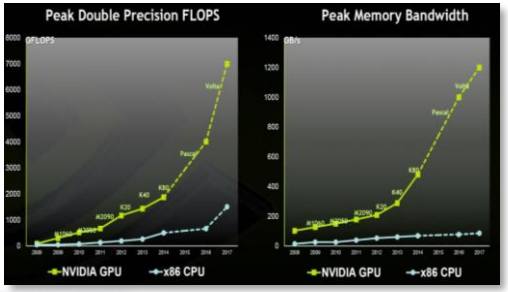
Why Deep Learning Took Off?

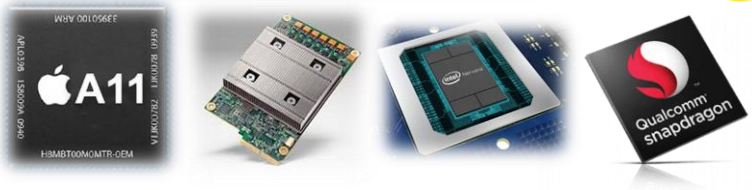
- Achieves the best performance in many tasks (classification, restoration, etc.)
  - *Complex training* but *simple testing phase*

Deep Learning (Neural Network)



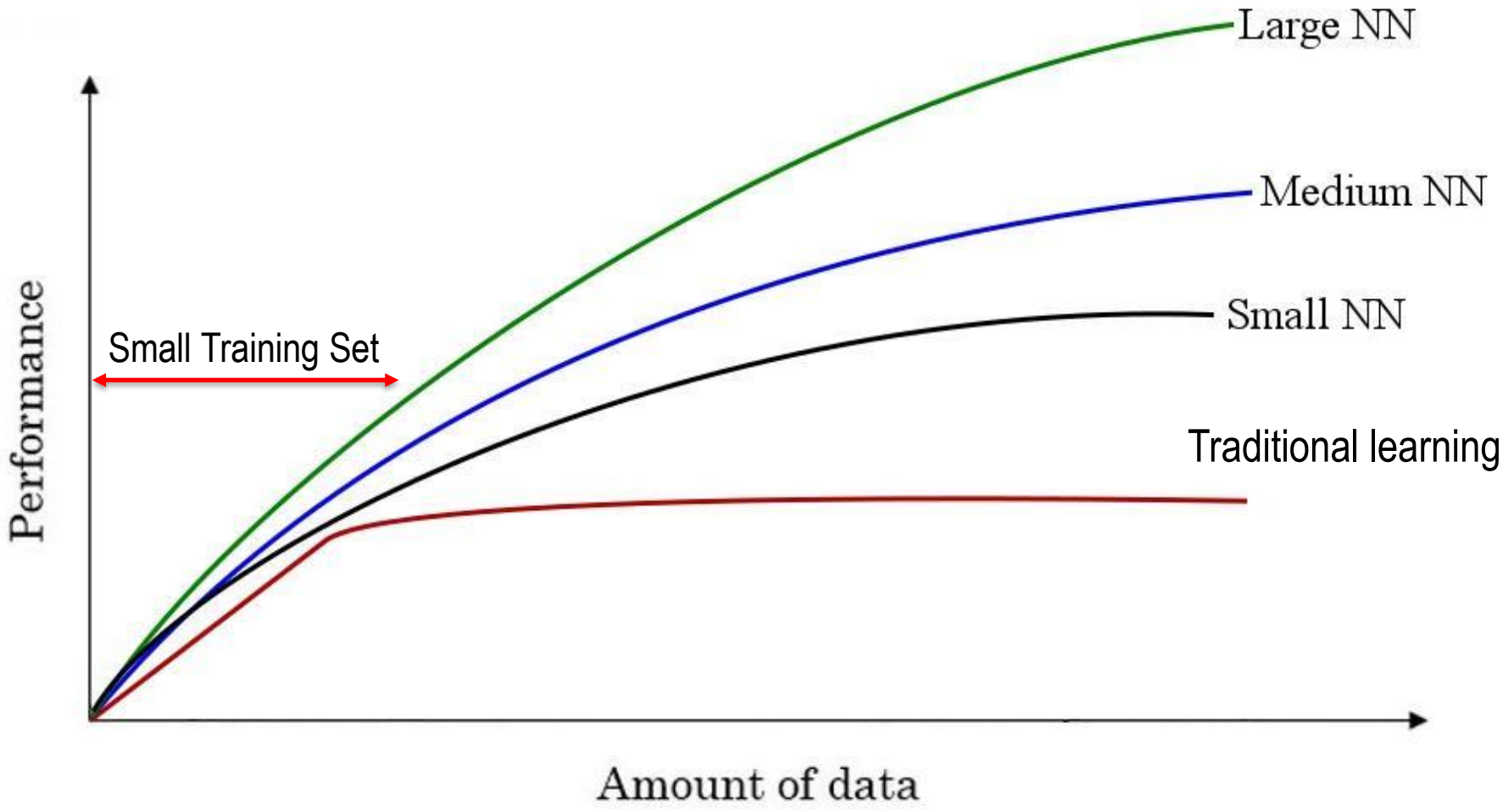
Computing power increases dramatically



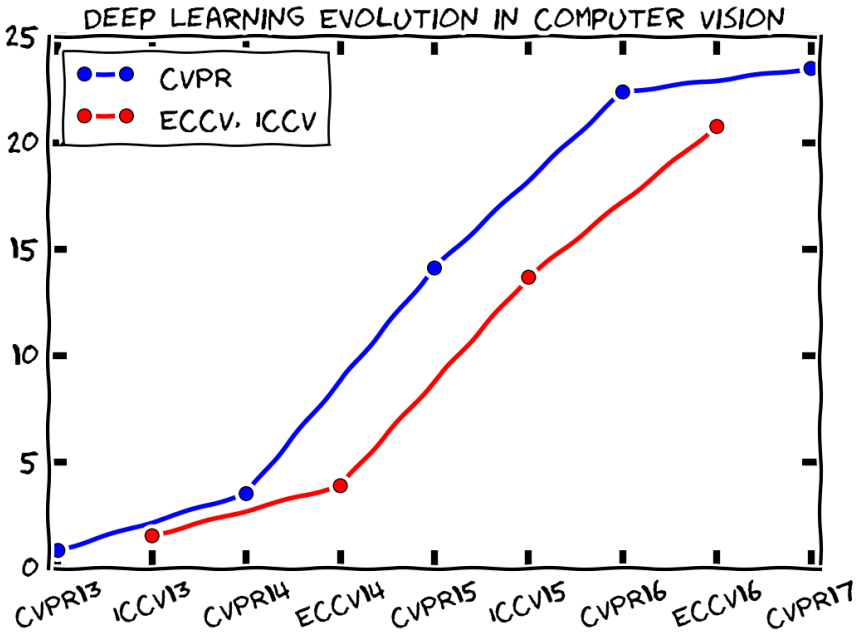


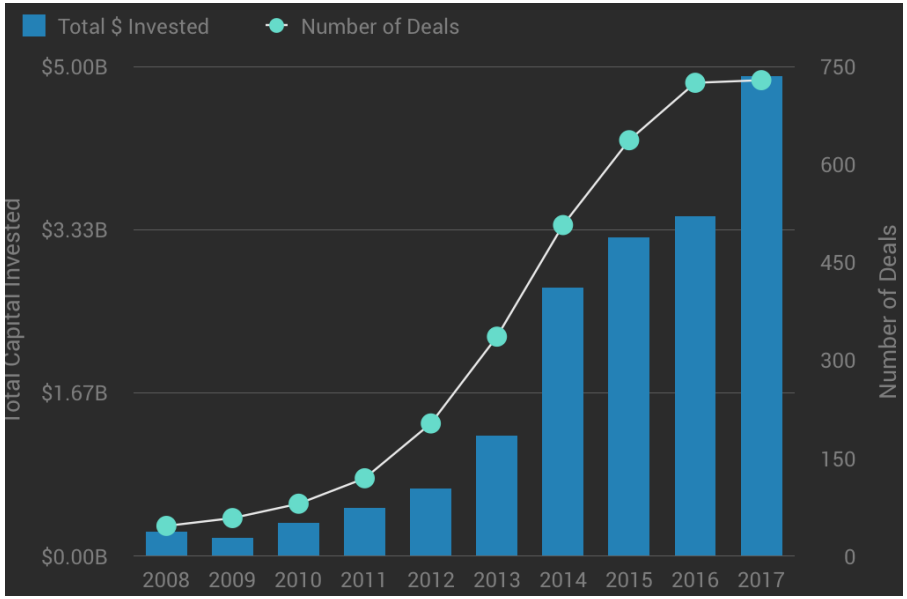
Shaping the industry/consumer products

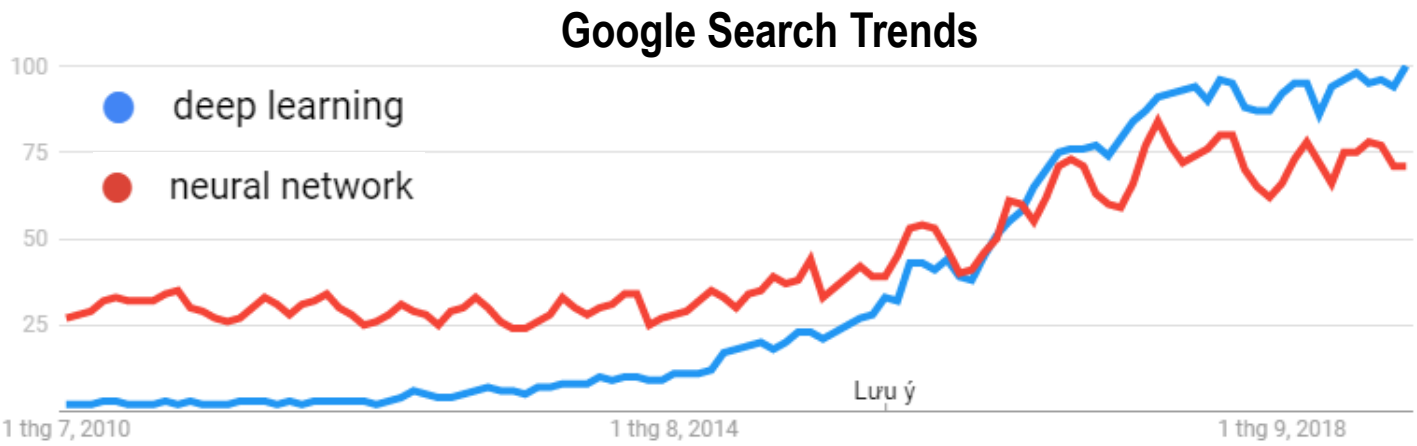
Why Deep Learning Took Off?



Deep Learning in Action



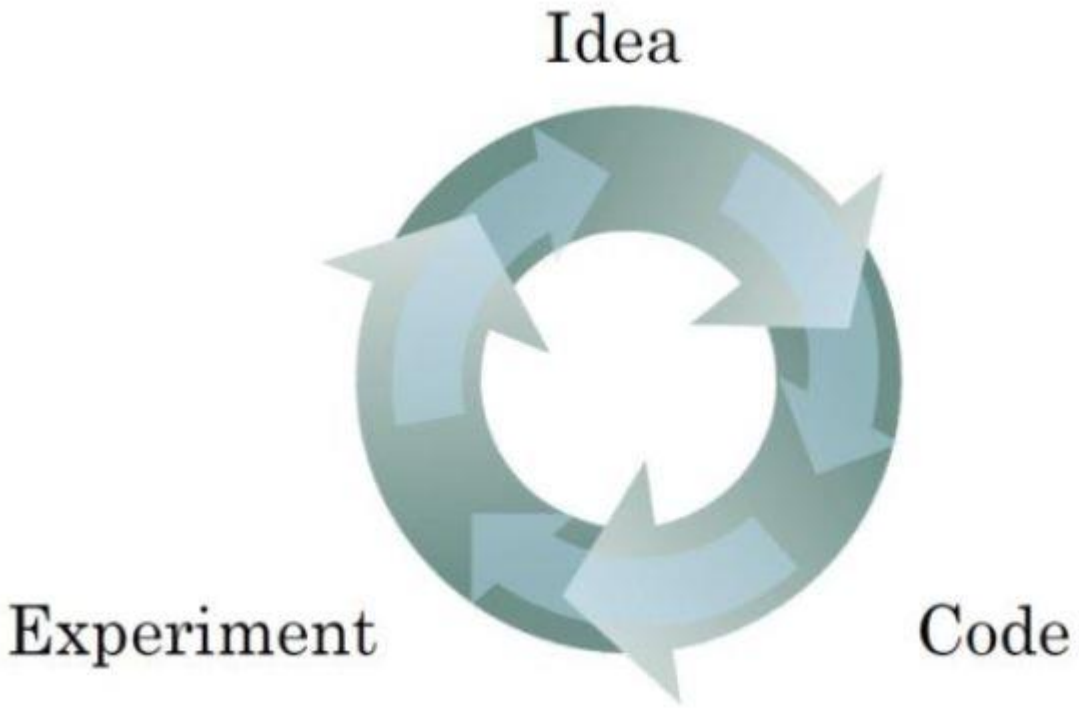




https://jponttuset.cat/dl-lstm-gan-evolution/

Deep Learning Process

- Data + Computation + Algorithm



Faster cycling, better algorithm, better results