Machine Learning is Fun!

...now with Python and TensorFlow!

About me

- Technical Lead @Evozon
- .NET developer for the last 6 years and counting
  - Web Services & Enterprise Integration
- Had the fortune and pleasure of teaching
  - Software Design @utcn
  - Design Patterns @ubb
- Lots of energy working with students
  - Internships, Workshops
- Research
  - Continuous Learning & Knowledge Fusion

Goals for today

Vision

- Intro in ML
- Focus on Deep Learning
- Hands-on work with TensorFlow
- Hands-on data classification

Motivation

- More comfortable with ML
- Understanding of how a complex ML framework like TensorFlow works
- Handwriting recognition
- Basis to start working with various ML algorithms

What is Machine Learning?

Machine Learning

Is the science of getting computers to act without being explicitly programmed

Machine Learning

Broadly, there are 3 types of Machine Learning Algorithms

- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning

Supervised Learning

Consist of

- a target / outcome variable to be predicted
- a given set of predictors (independent variables)

Generate a function that map inputs to desired outputs within a certain degree of accuracy

Supervised Learning

Examples:

- Regression
- Decision Tree
- Random Forest
- KNN
- Logistic Regression

Unsupervised Learning

We do not have any target or outcome variable to predict

It is used for clustering population in different groups

Unsupervised Learning

Examples:

- Apriori algorithm
- K-means

Reinforcement Learning

The machine is trained to make specific decisions

- The machine is exposed to an environment where it trains itself continually using trial and error
- This machine learns from past experience
- Tries to capture the best possible knowledge to make accurate business decisions

Reinforcement Learning

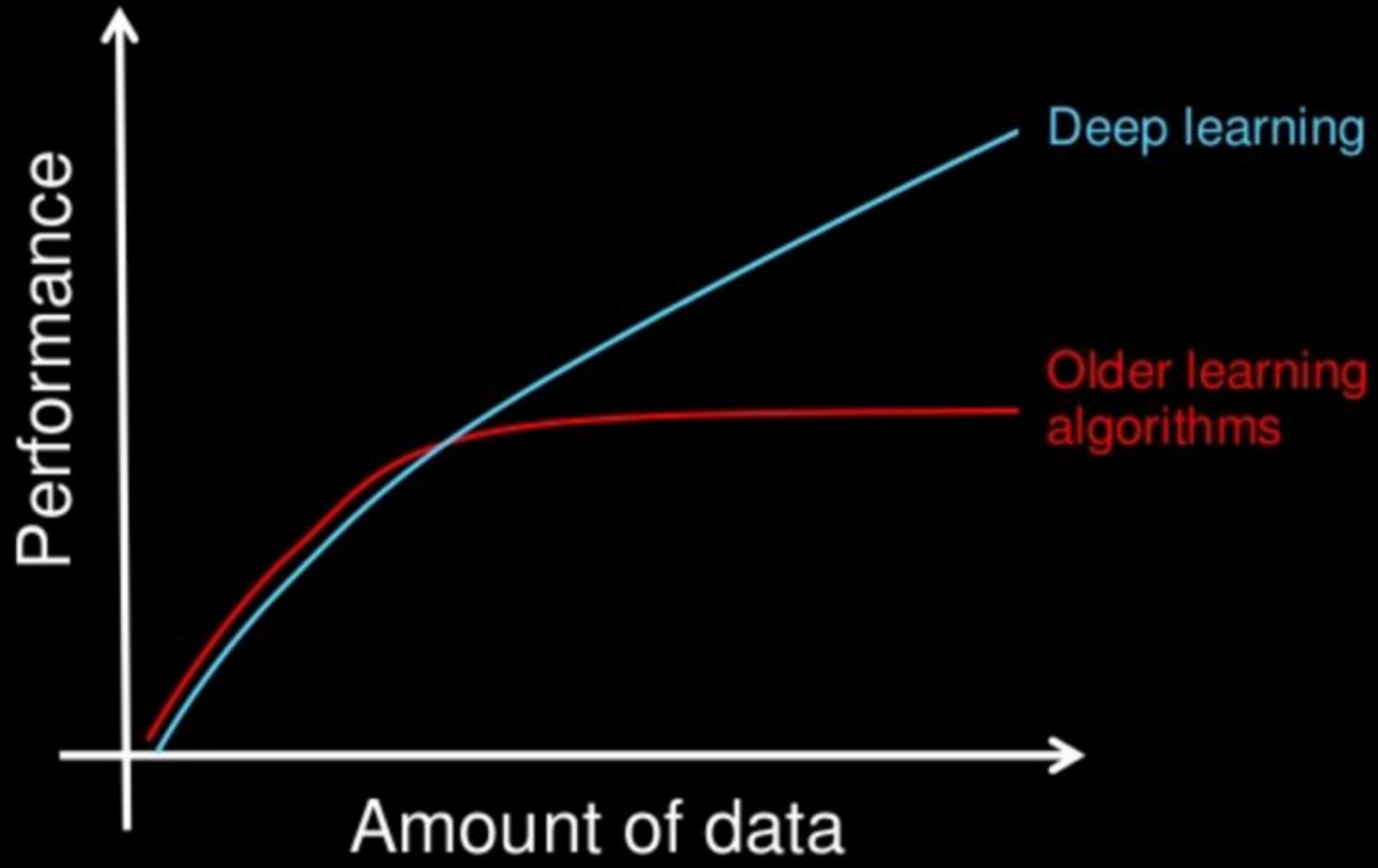
Example:

- Markov Decision Process

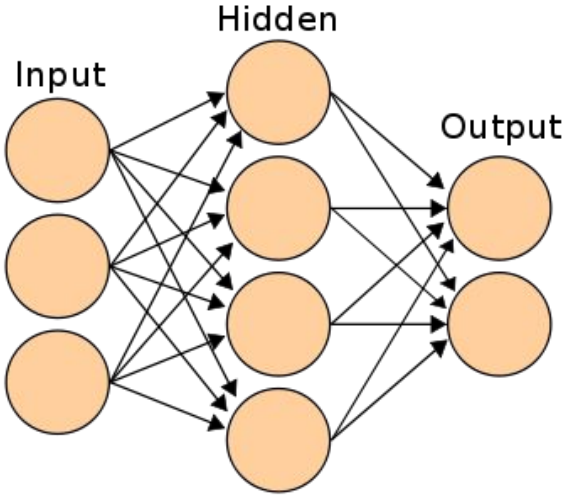
Deep Learning

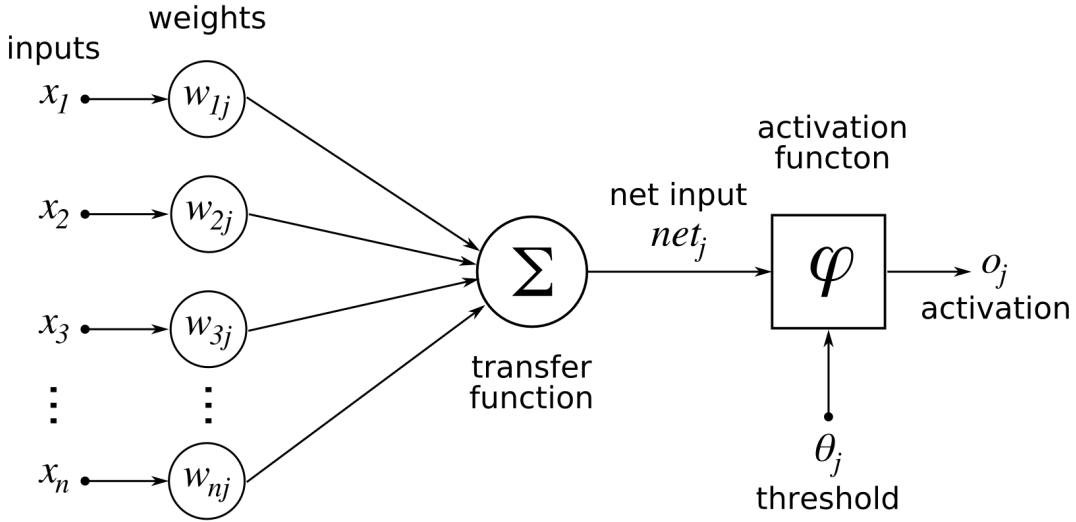
Is a subfield of machine learning concerned with algorithms inspired by the structure and function of the brain called artificial neural networks

- Interconnected units
- Activation signals
- Information processing
- Adjusting connections
- Matrix multiplication :)


Performance
Deep learning
Older learning algorithms
Amount of data

Artificial Neural Networks





bit.do/evz-ml

TensorFlow Basics

Classification Task Estimators APIs

Questions?

References

https://www.coursera.org/learn/machine-learning/lecture/Ujm7v/what-is-machine-learning

https://machinelearningmastery.com/what-is-deep-learning/

https://www.katacoda.com/basiafusinska/courses/tensorflow-in-3-sentences

http://yann.lecun.com/exdb/mnist

Thank you!

“Any sufficiently advanced technology is indistinguishable from magic”

-Arthur C. Clarke