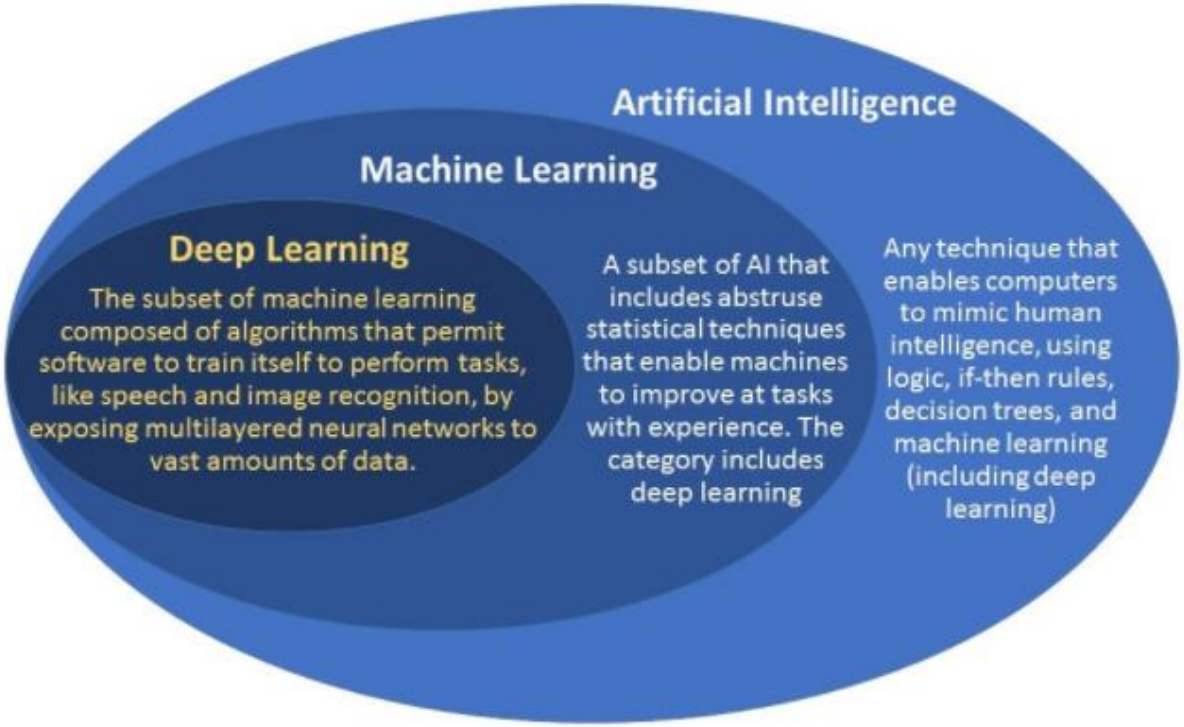
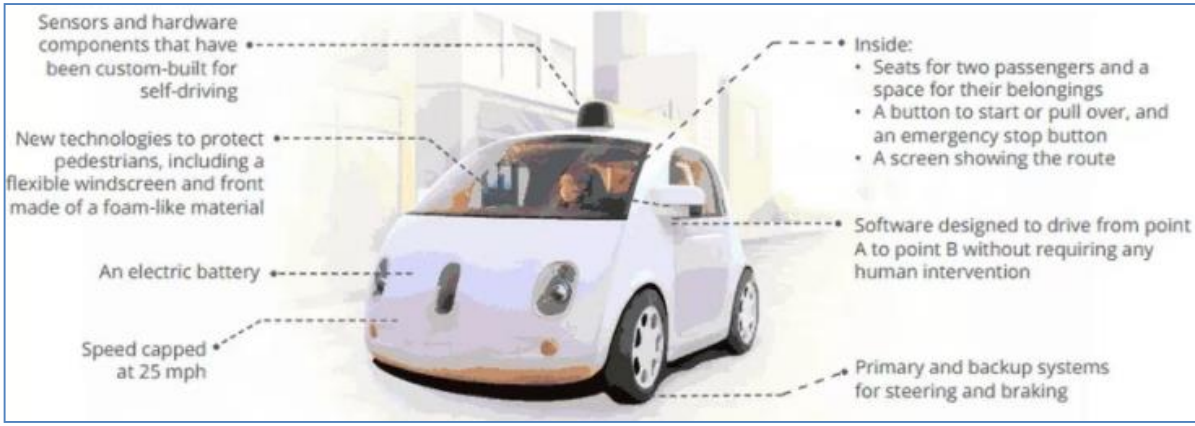
AI, Machine Learning and Deep Learning

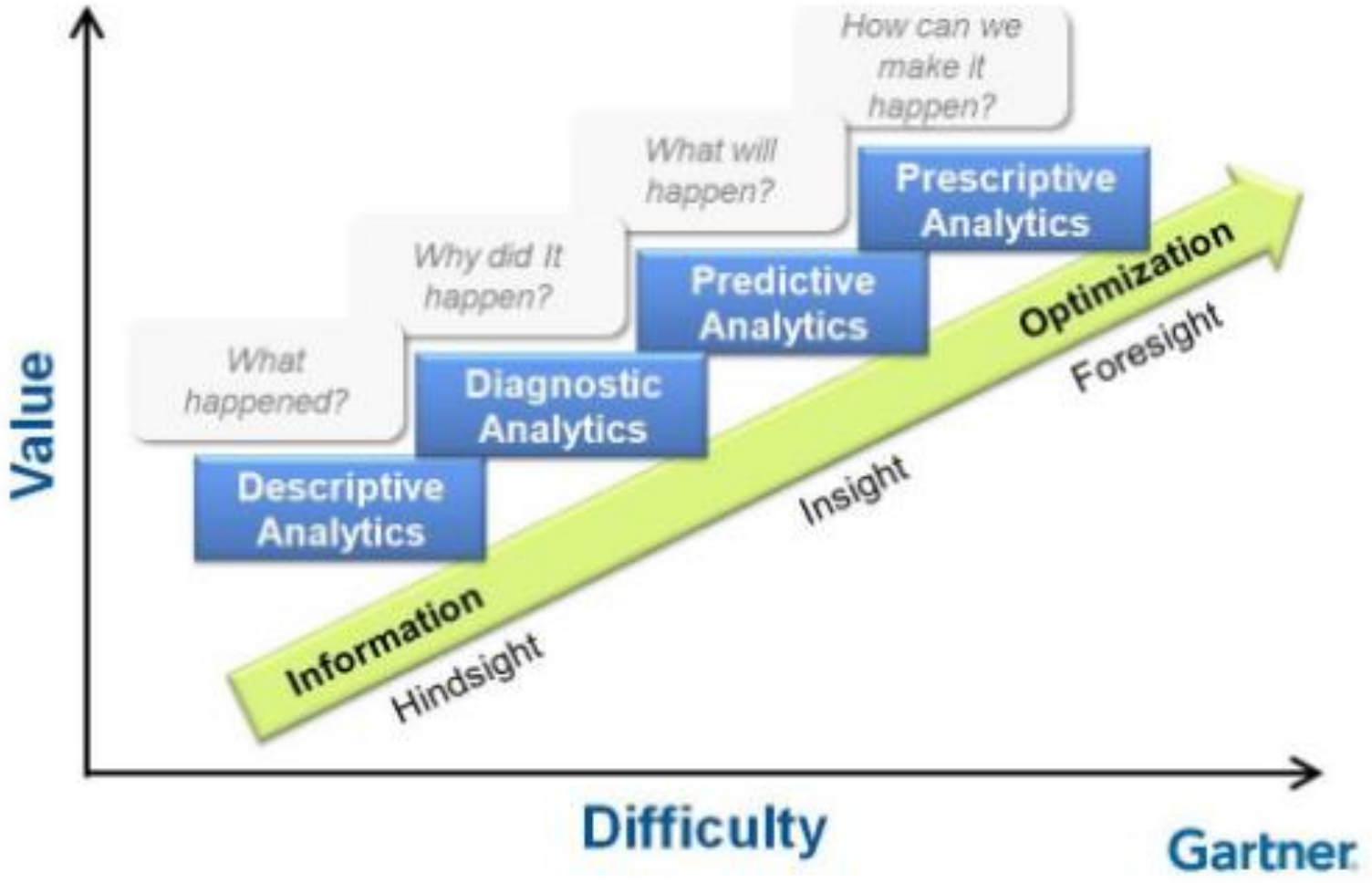


Cross selling and up selling

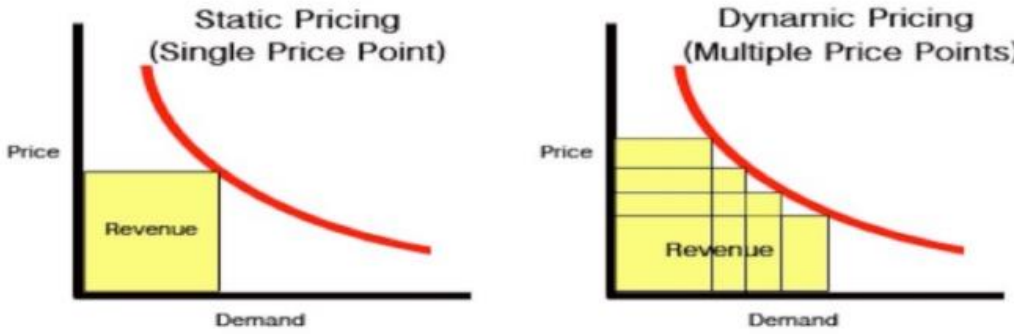


Driverless Car

Data Analytics from Descriptive to Prescriptive



Airfare Price Optimization

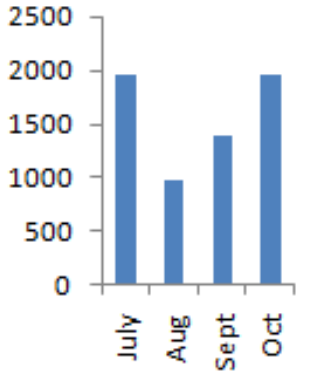


Airfare Price Optimization

Booking Txn ID	Txn Timestamp	Name	Flight	From	To	Airfare Price	Profit (Fcost-2000)
11111	10th Oct 2016	XYZ	F1	Hyd	Blore	3000	1000
222222	10th Oct 2016	wxy	F1	Hyd	Blore	3100	1100
3333333	10th Oct 2016	xyw	F1	Hyd	Blore	5000	3000
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
999999999	1st Nov 2017	mnx	F1	Hyd	Blore	5500	3500
999999999	2nd Nov 2017	abc	F1	Hyd	Blore	5600	3600

Historical Txn detailed data

Month	# Air Passengers
July	1950
Aug	975
Sept	1400
Oct	1955



Airfare Price Optimization

Month	# Air Passe	Holidays(N)	Festivals#	Events(N)
July	1950	less	less	Summ Vac ends
Aug	975	Less	less	NA
Sept	1400	More	More	NA
Oct	1955	Most	Most	NA

Exploratory Analysis

Month	# Air Passengers	Forecast
July	1950	2350
Aug	975	1100
Sept	1400	1556
Oct	1955	2190

Airfare Price Optimization

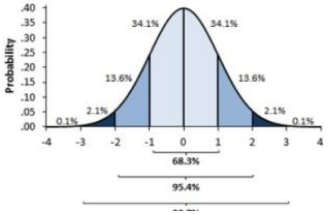
Data Science – A Definition

Data Science is the science which uses computer science, statistics and machine learning, visualization and human-computer interactions to collect, clean, integrate, analyze, visualize, interact with data to create data products.

Goal of Data Science – Turn Data into Data Products

Data Engineering

Statistics



Data Science

Visualization

Machine Learning ML/ DL

Important Use Cases of Data Science

- **Fraud Detection**
  - Banking Fraud, Insurance Fraud, Telecom Fraud, Retail Fraud

- **Recommender Engines**
  - Avg 30-35% of online vendor revenue is generated by recommender engines
- **Customer Analytics**
  - Buyer Behavior, Customer Buying habits
- **Forecasting Revenue, Margin, Market Price**
  - Predicting the future values to take strategic decision

- **Sweet Spot Optimization**
  - Optimizing the best value to maximize the revenue/profit
- **Market Segmentation**
  - Identifying customer segments to take appropriate strategy
- **Internet Search**

Machine Learning

Machine learning is a method of data analysis that uses algorithms that iteratively learn from data to find hidden insights/patterns automatically without being explicitly programmed where to look.

- Like Human learning from past experiences.

- A computer systems learns from **historical data,** which represents some past experiences of an application domain.

- The goal is to learn a **target function** that can be used to predict the response variable (Regression/Classification).

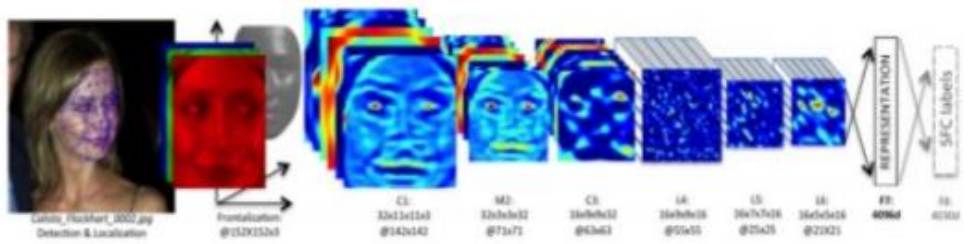
- **Supervised** and **Unsupervised** Machine Learning.

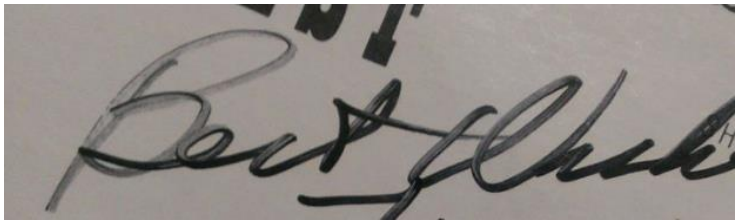
Deep Learning & NLP

Deep Learning is a subset of Machine Learning based on Neural Network Algorithms, very useful in Image and Video Analytics.

Image and Video Analytics :

- Facial Recognition
- Image Insights
- Motion Detection
- Visual Content Analysis
- Hand written text recognition

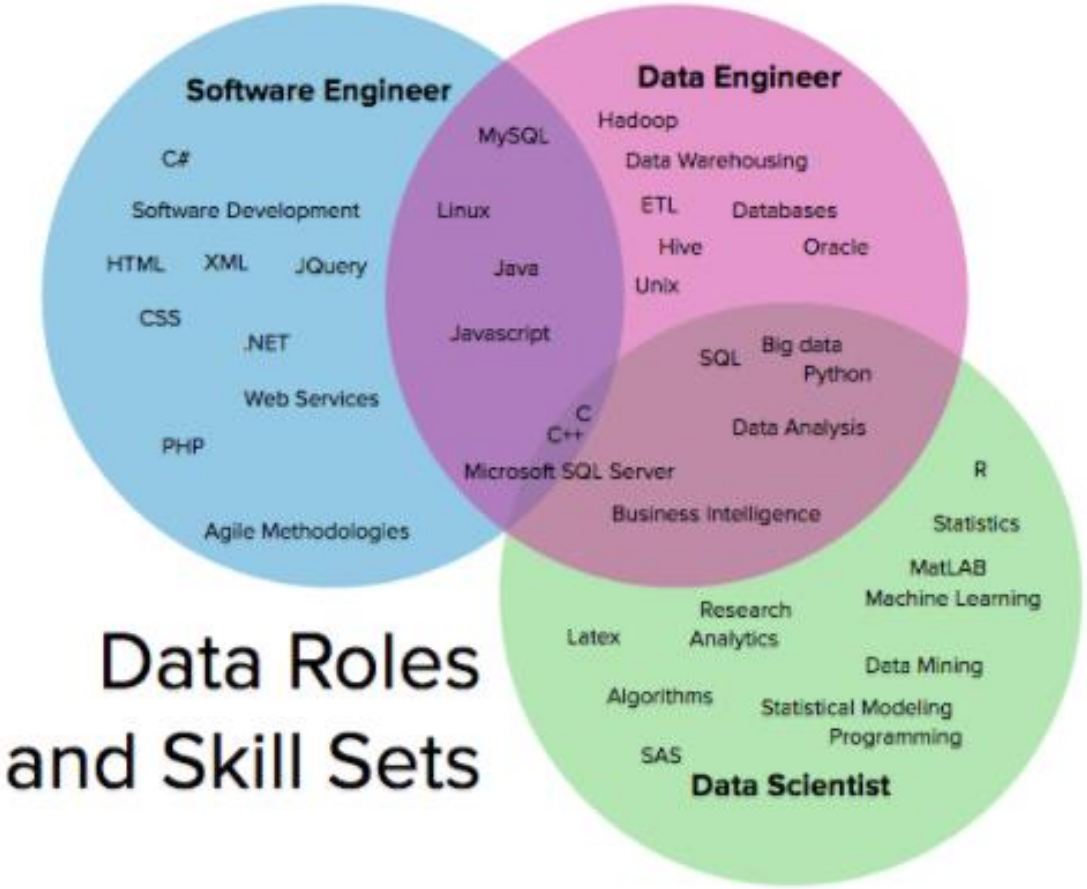




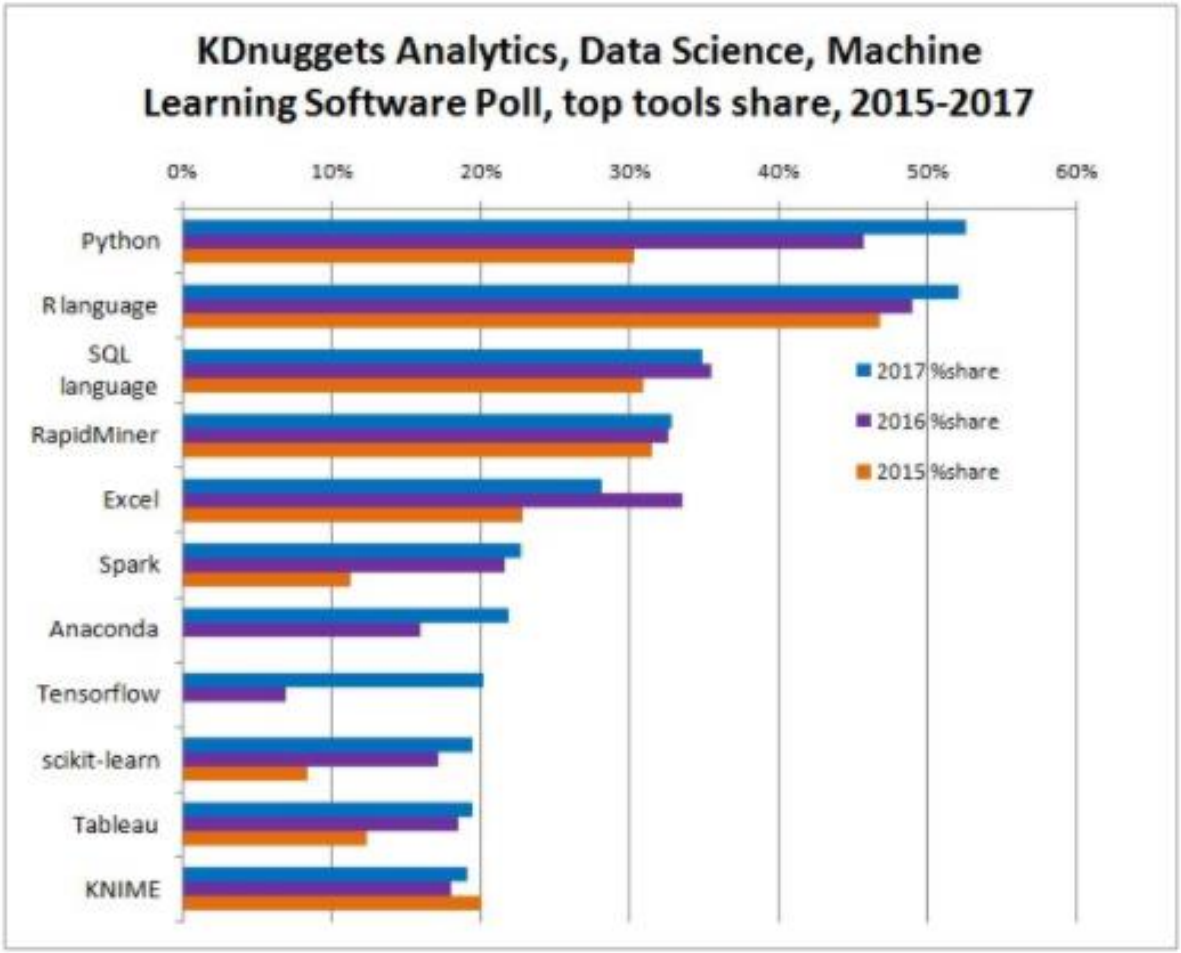
NLP and Text Analytics:

- Sentiment Analysis
- Speech Recognition
- Conversational System Chatbot
- Text Classification
- Text Similarities
- Machine Translation
- Text Summarization

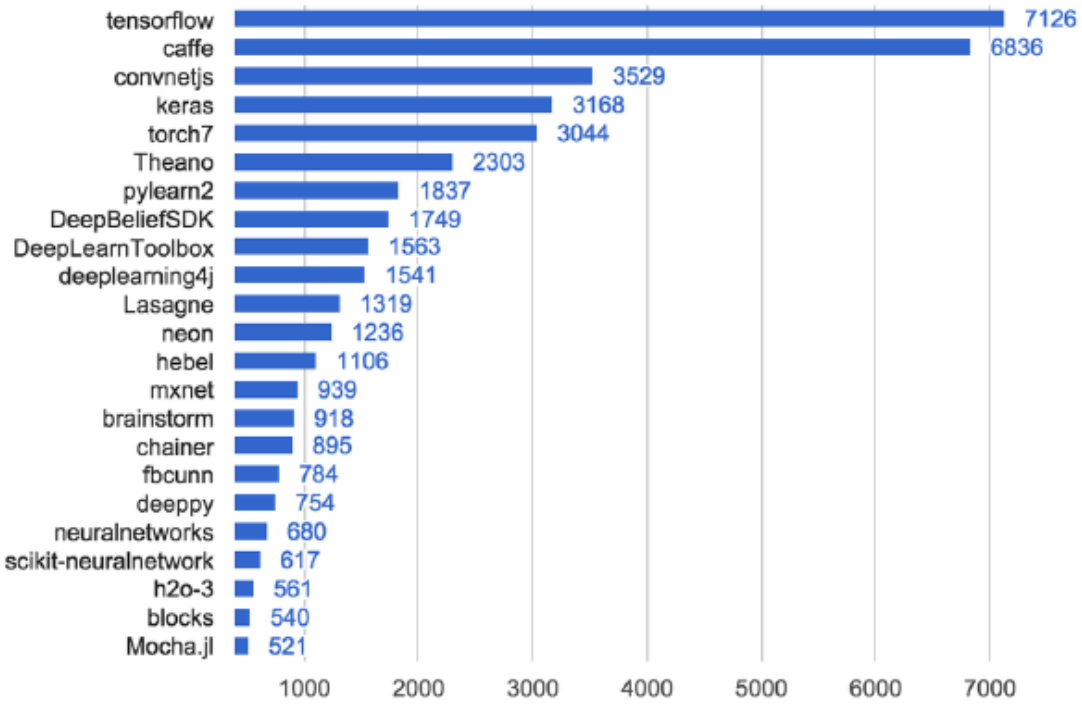
Data Roles and Skill Sets



Popular Skills for Data Science 2015-2017



Deep Learning – Tools (open source)



keras :

Deep Learning Library in python for Theneo and Tensor flow for developing and evaluating deep learning models

It wraps the efficient numerical computation libraries Theano and TensorFlow

Deep Learning computation libraries:

TensorFlow : supported by Google

Theano : supported by University of Montreal's MILA

Torch : supported by Facebook, Twitter and NVIDIA

Thank You.