

# Machine Learning

## An Academic Point of View

THE IT VILLAGE V 2.0

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Abdelhak Mahmoudi

[abdelhak.mahmoudi@um5.ac.ma](mailto:abdelhak.mahmoudi@um5.ac.ma)

# Content

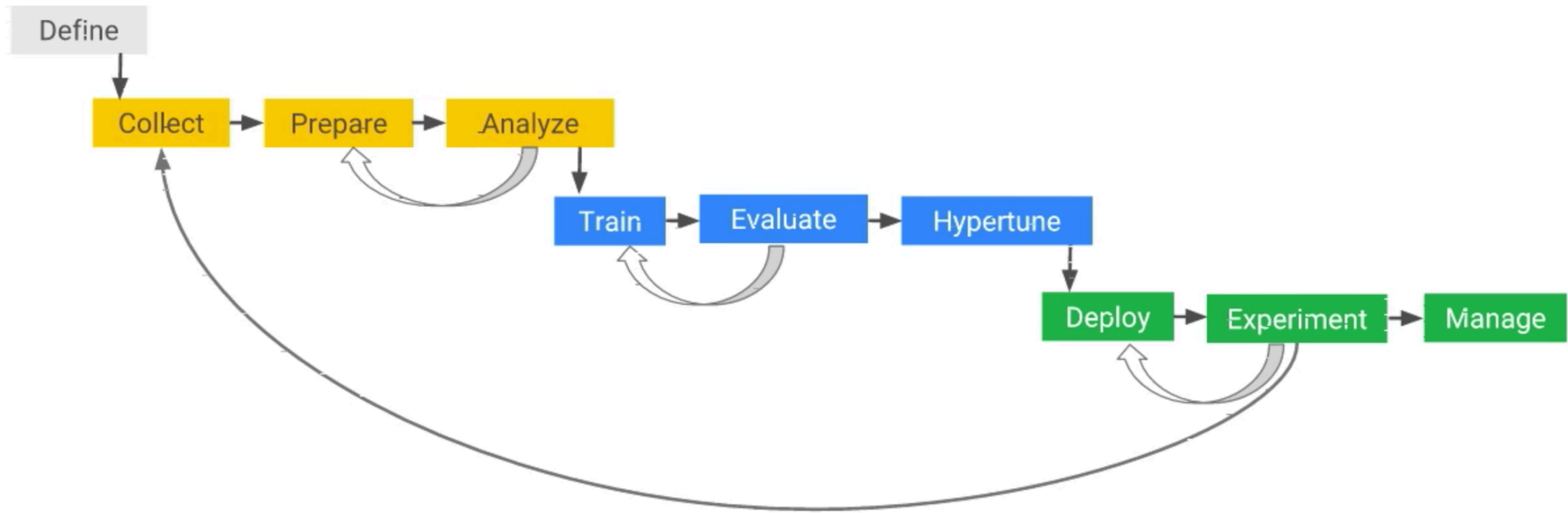
- Machine Learning Everywhere
- ML Project Lifecycle
- How can I Learn?
- How can I Apply?
- 2019 AI Trends

# Machine Learning Everywhere

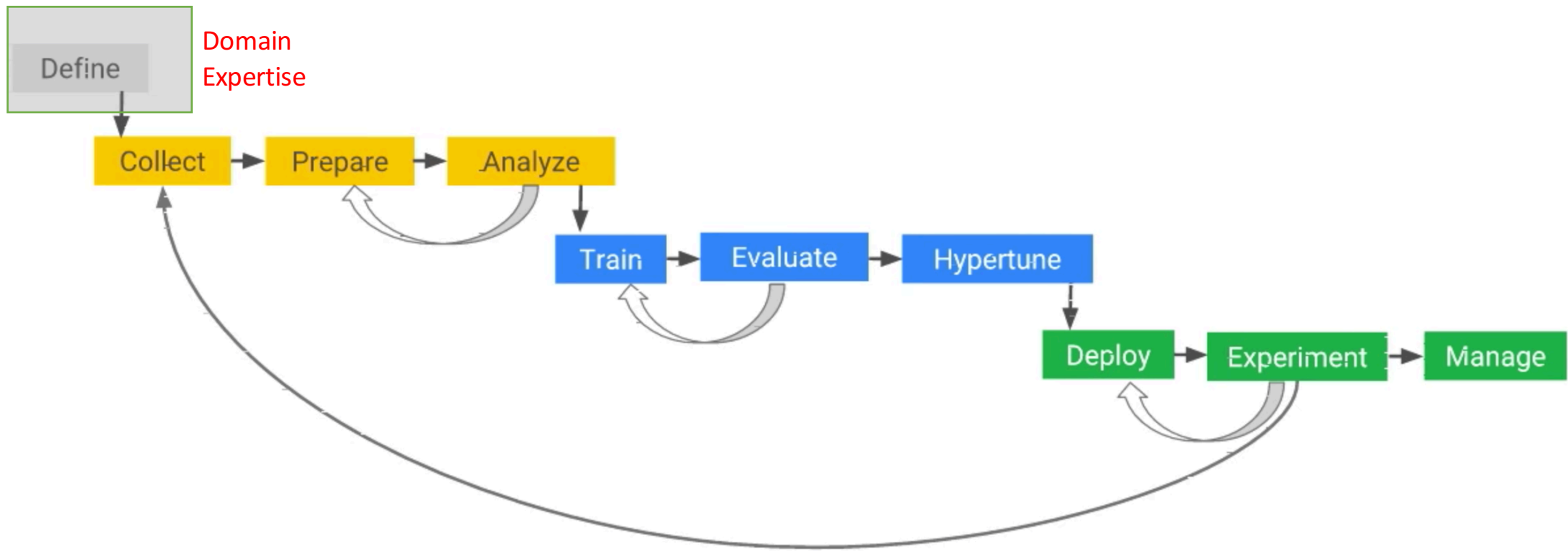
## **The Top 10 AI And Machine Learning Use Cases Everyone Should Know About**

1. Data Security,
2. Personal Security,
3. Financial Trading,
4. Healthcare,
5. Marketing personalization,
6. Fraud Detection,
7. Recommendations,
8. Online Search,
9. Natural Language Processing,
10. Smart Cars

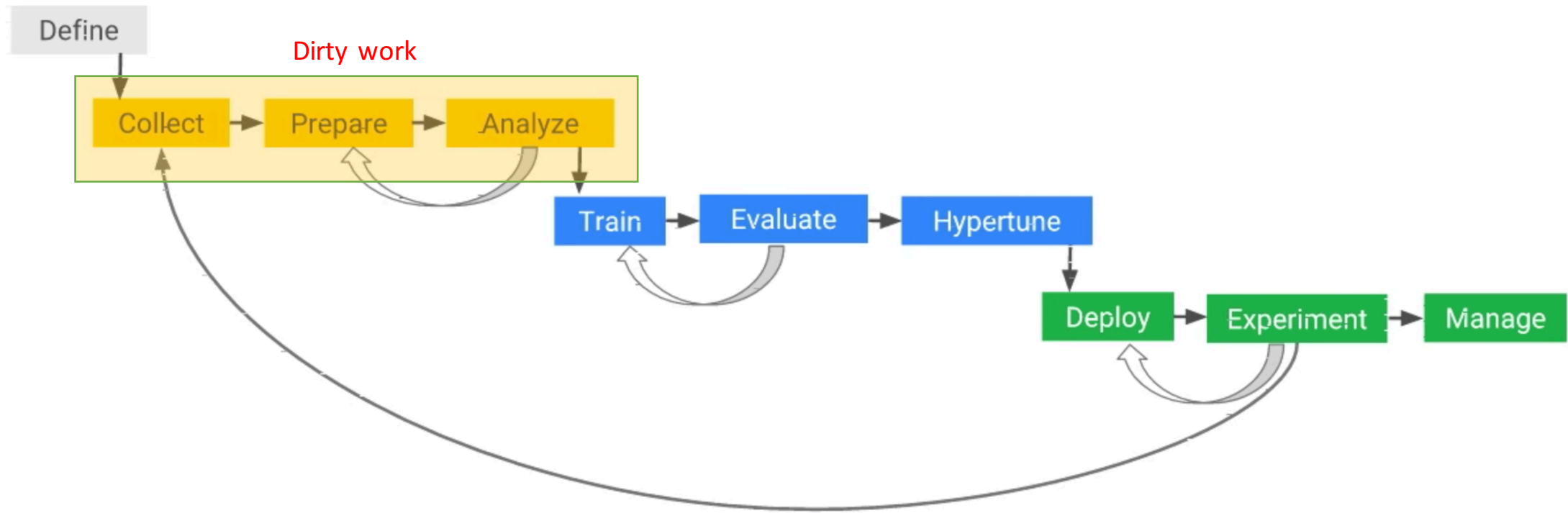
# ML Project Lifecycle



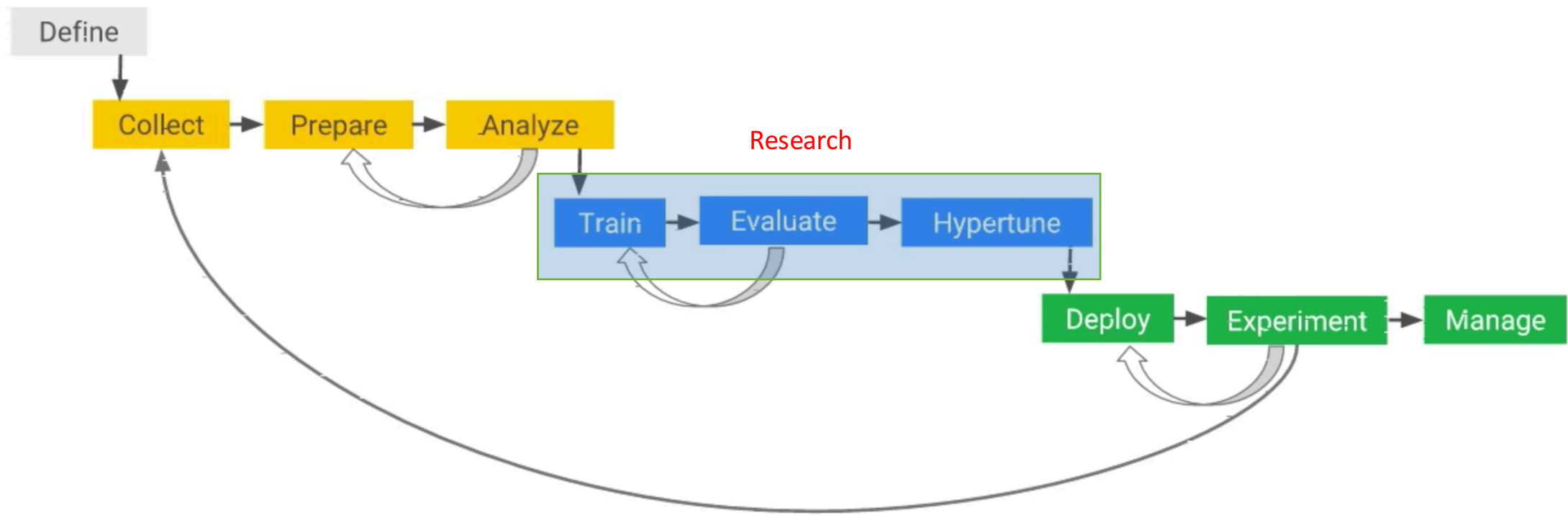
# ML Project Lifecycle



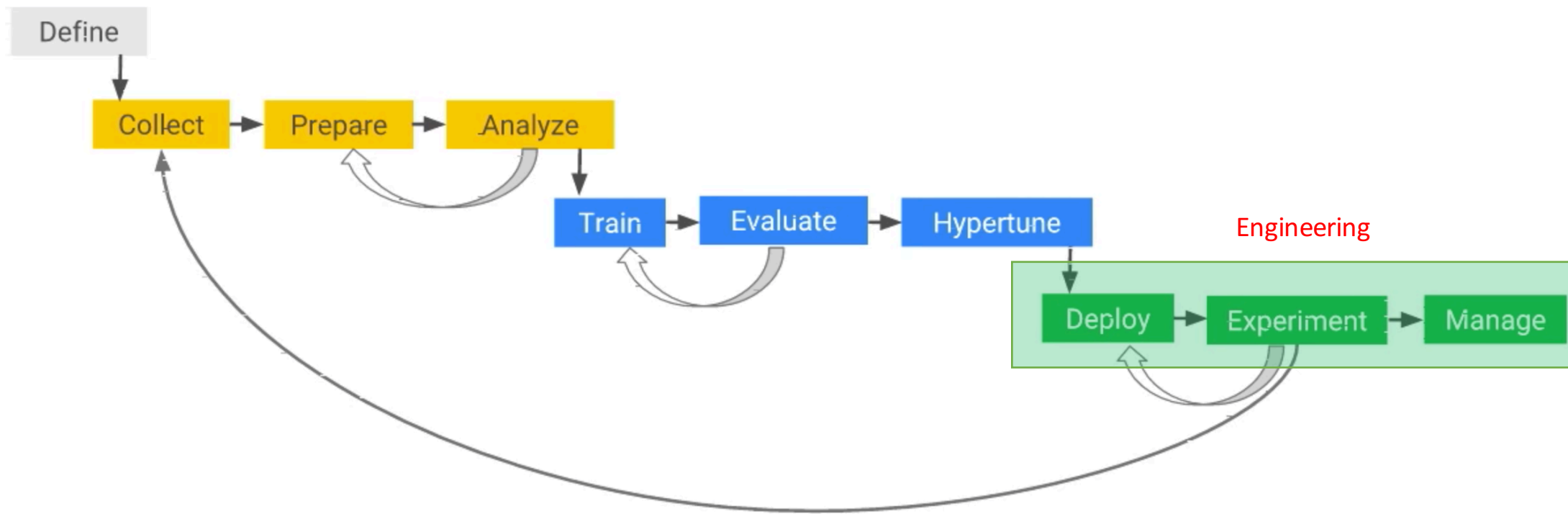
# ML Project Lifecycle



# ML Project Lifecycle



# ML Project Lifecycle





How Can I Learn?

# How can I Learn?

- Math
  - Statistics, Probabilistic Graphical Models, Algebra, Optimization
- Programming Languages
  - Python, R, others
- Books
  - Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani. “An introduction to statistical learning with applications in R”. 2013.
  - Tom M. Mitchell. “Machine Learning”. 1997
  - [Others](#)

# How can I Learn?

- MOOCs
  - Coursera: Machine learning, Deep learning specialization
  - Udacity, Udemy, Fun, etc.
- StackOverflow
- Research Papers
  - Read and rewrite algorithms from scratch
- Follow People
  - Andrew Ng, Yann LeCun, Jeff Hinton, Yoshua Bengio, Chris Manning, Sebastian Thrun, etc.

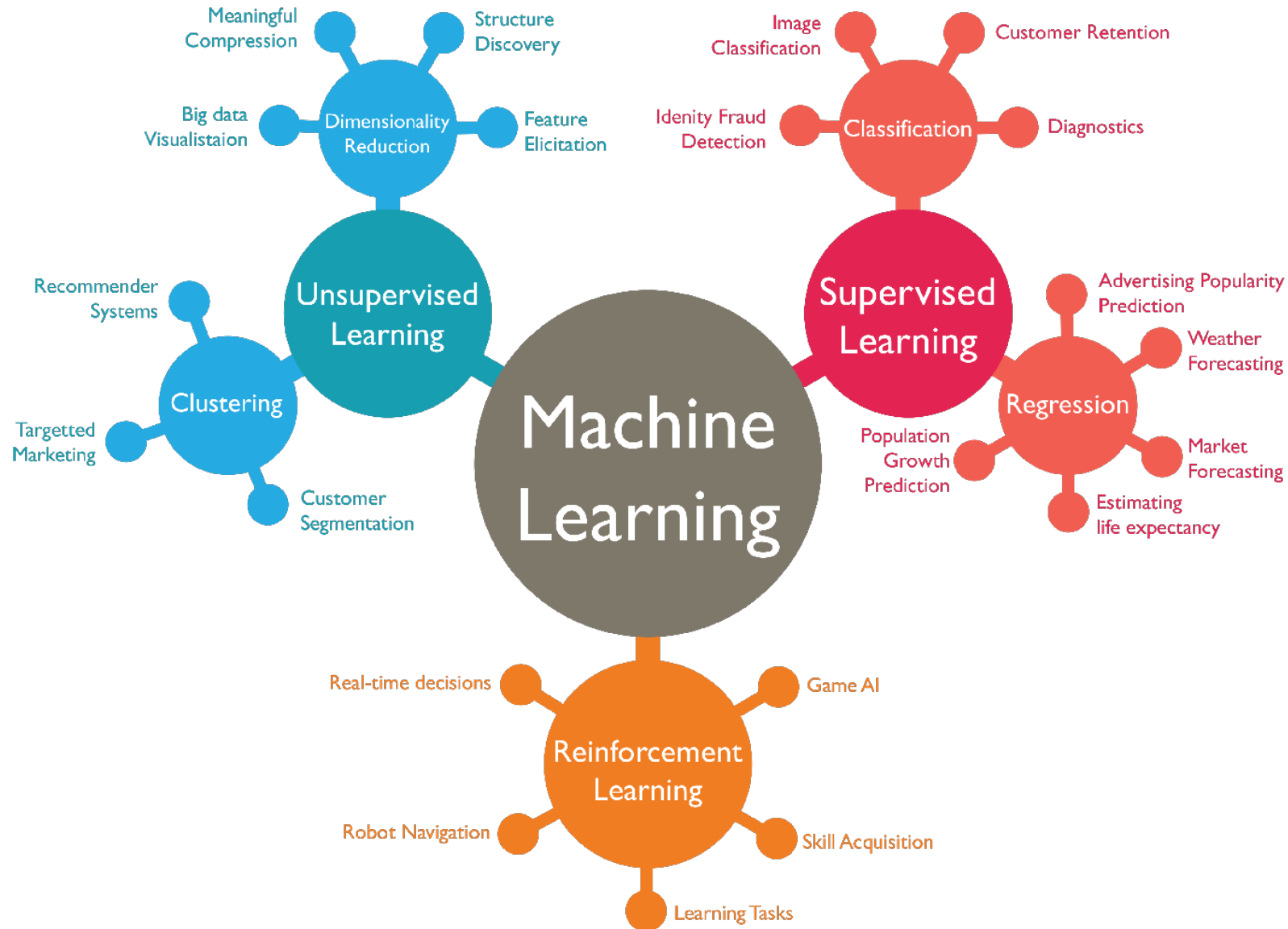
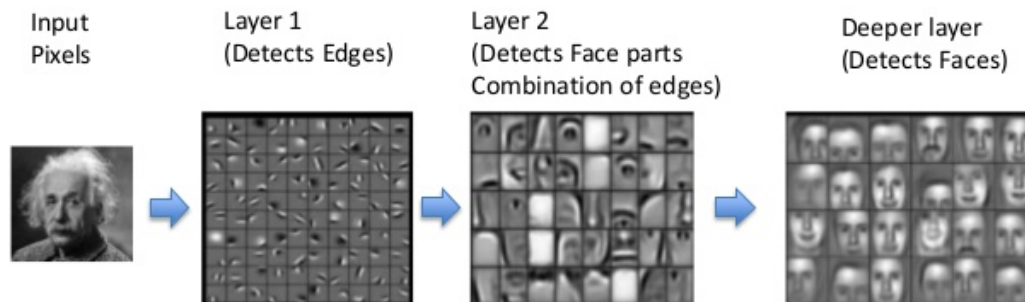
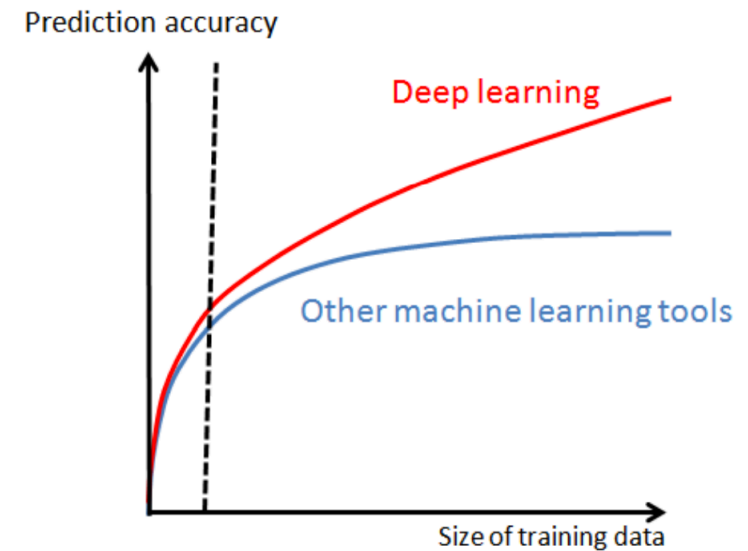
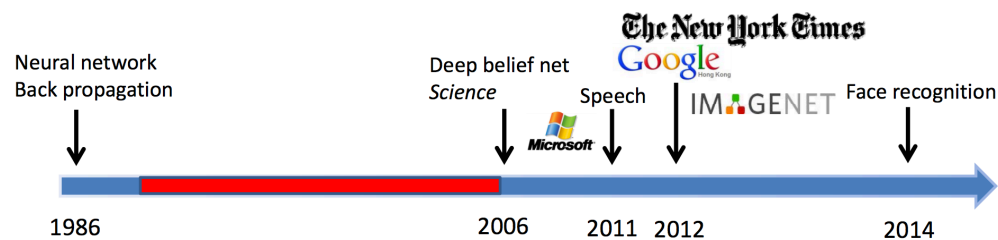


Image via [Abdul Rahid](#)

# Why Deep Learning?



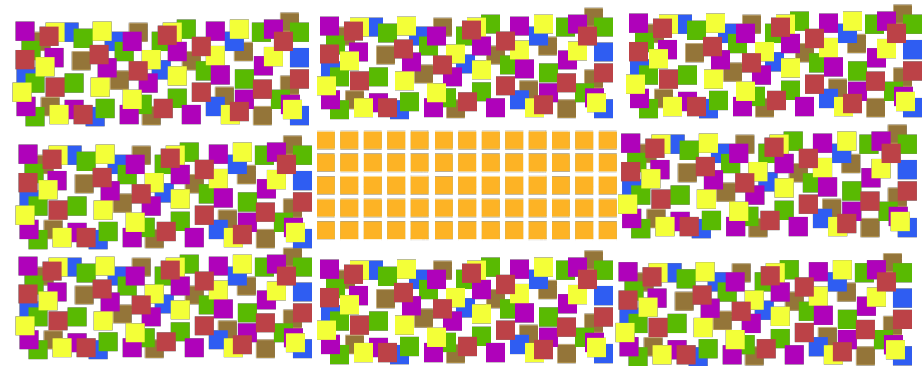
How Can I Apply?

# How can I Apply?

- Start small projects and use Frameworks
  - [TensorFlow](#), [Keras](#),
  - [Caffe](#),
  - [Microsoft Cognitive Toolkit](#) (CNTK 2),
  - [MXNet](#),
  - [Scikit-learn](#),
  - [Spark MLlib](#),
  - etc.

# How can I Apply?

- Kaggle, UCI Machine Learning Repo
  - Find data
  - Go for competitions



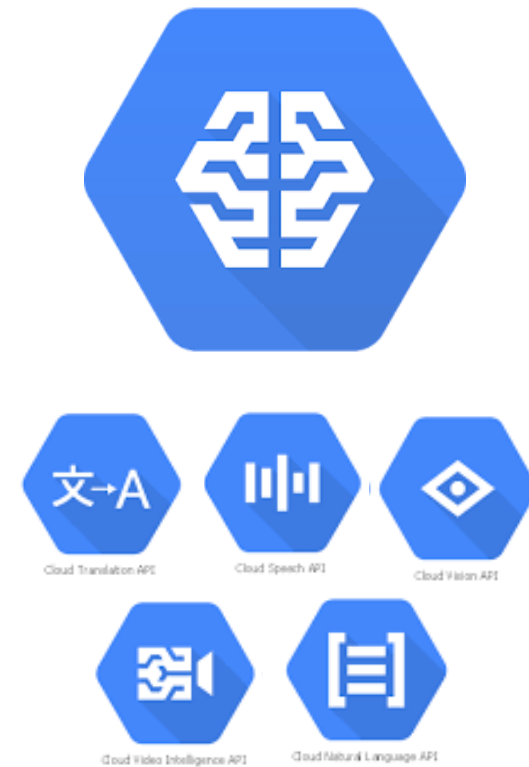


# How can I Apply?

- Notebooks
  - Colab,
  - Jupyter notebook,
  - google cloud Datalab,
  - Github,
  - Share your code

# How can I Apply?

- Google ML APIs
  - Vision API
  - Video Intelligence API
  - Speech API
  - Natural Language API
  - Translation API



# 2019 AI Trends

## 5 Artificial Intelligence Trends To Watch Out For In 2019

- 1. The rise of AI-enabled chips**
  - Intel, NVIDIA, AMD, ARM and Qualcomm
- 2. Convergence of IoT and AI at the edge**
  - Nowadays, Train in the **Cloud** or **Fog**, predict locally
  - Tomorrow, Train and predict **locally**
- 3. Interoperability among neural networks becomes key**
  - AWS, Facebook and Microsoft build Open Neural Network Exchange (ONNX)
- 4. Automated machine learning will gain prominence**
- 5. AI will automate DevOps through AIOps**
  - Operation logs, industry 4.0

THANKS!

# Terminologies

# Terminologies

- Artificial Intelligence
- Machine Learning
- Statistical Learning
- Deep Learning
- Big Data
- Data Science

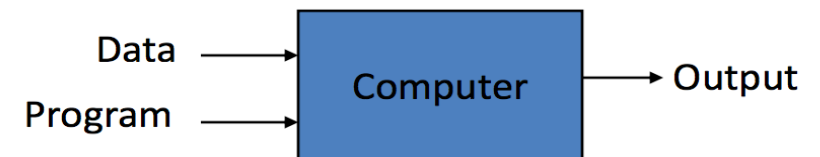
# Terminologies

- Artificial Intelligence (**1943**)
  - [McCullouch](#) and [Pitts](#)'
  - Intelligent Machines mimics Natural Intelligence (NI)
  - Intelligent Agents interacting with their environment → Robotics

# Terminologies: Machine Learning (1959)

- Artificial Neural Networks (**1975**)
  - Begin in 1943,
  - stagnated in 1969,
  - relaunched in 1975 by the Backpropagation algorithm,
- Deep Learning (**2006**)
  - Much powerful in the Age of Big data and distributed processing

## Traditional Programming



## Machine Learning

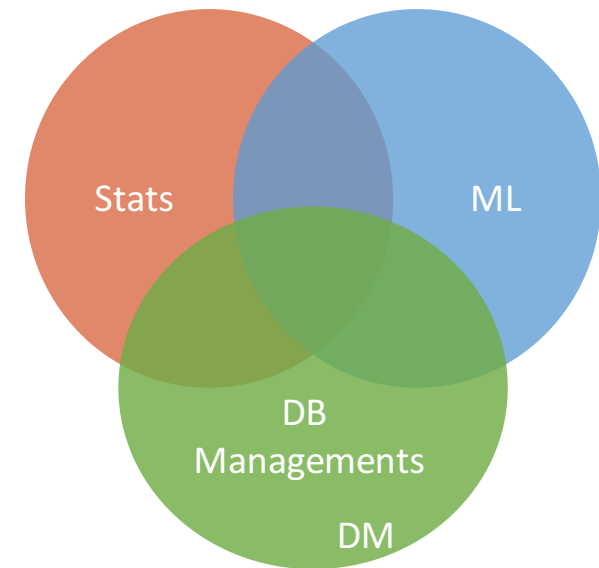




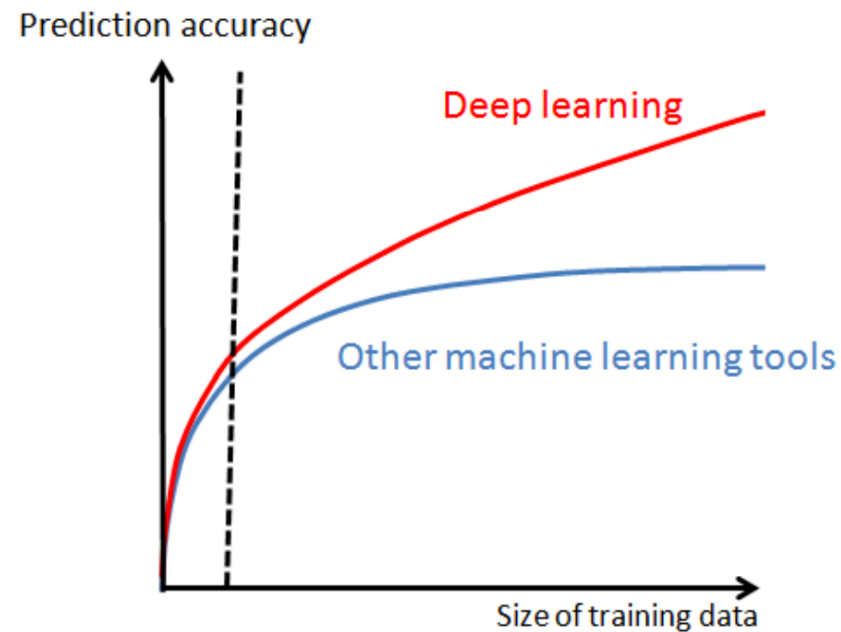
# Terminologies: Statistical Learning (1968)

- Statistics : A subfield of **Mathematics** which deals with **finding relationship between variables**.
- Support Vector Machines (**1995**)
  - Much simpler, overtook ANN, Vapnik V. N.

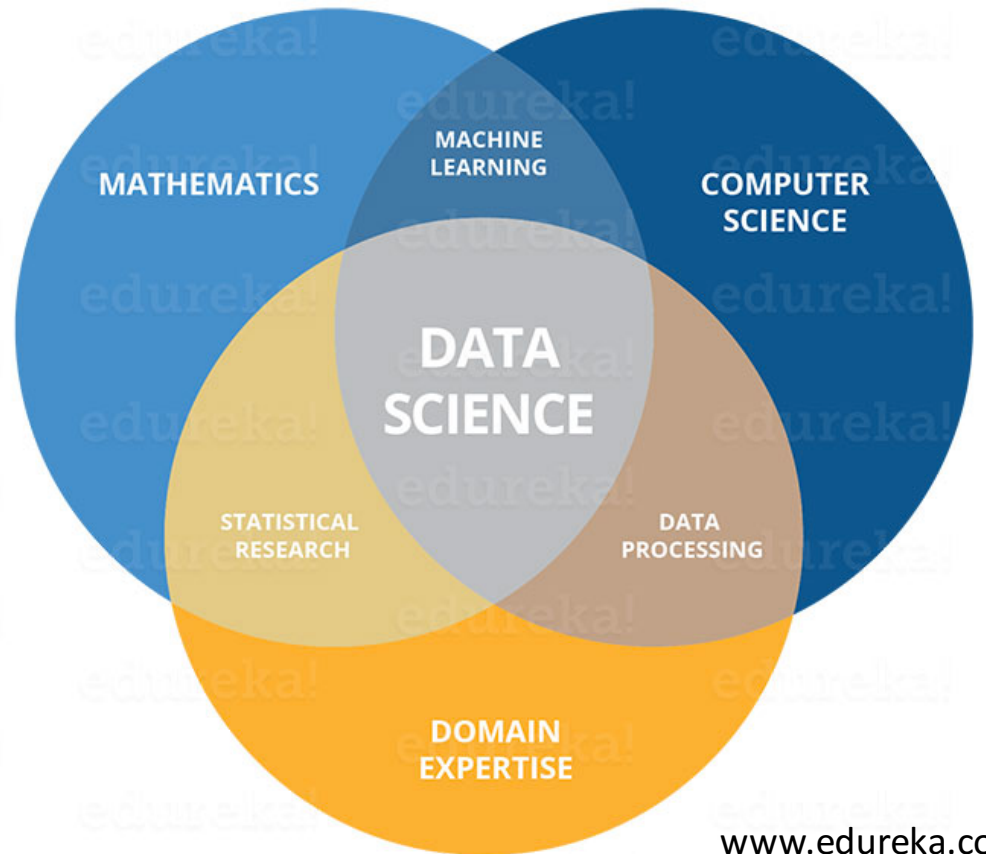
# Terminologies: Data Mining (1990)



# Terminologies: Big Data (1997)



# Terminologies: Data Science (2001 )



[www.edureka.co](http://www.edureka.co)