DATA IS THE NEW SCIENCE

# DATA SCIENCE / AI / IOT

## Orientation Session


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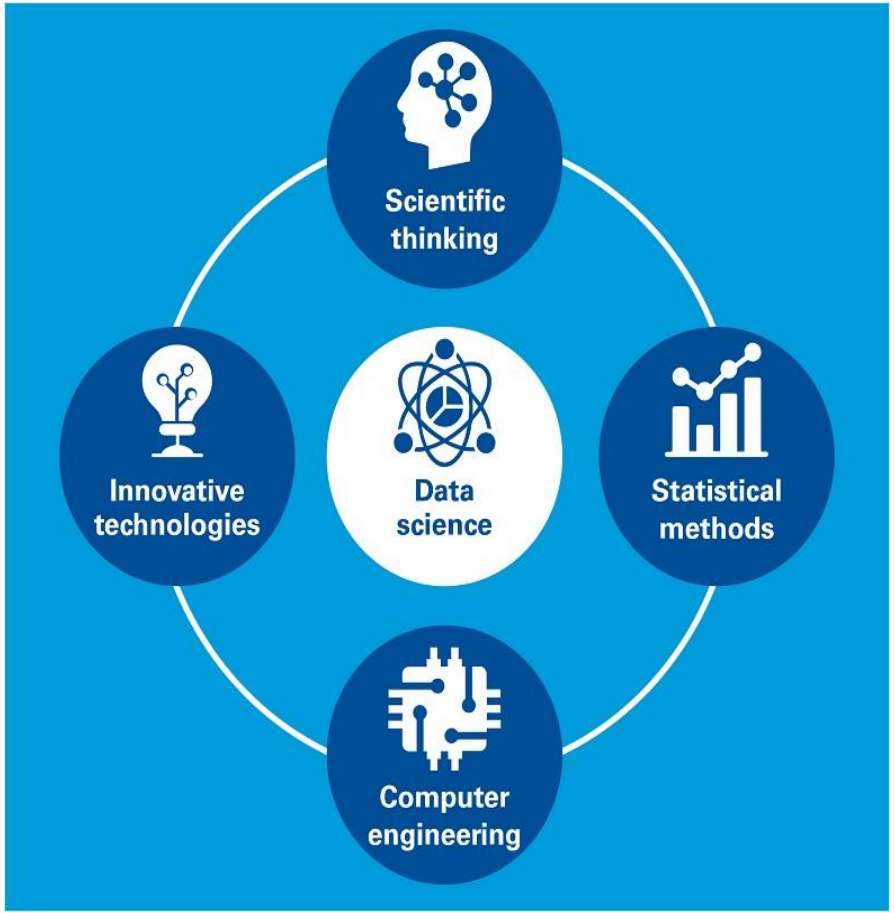
# WHAT IS DATA SCIENCE

**Data science** is an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from many structural and unstructured data. Data science is related to **data mining, machine learning and big data.**

Data science is a "concept to unify statistics, data analysis and their related methods" in order to "understand and analyze actual phenomena" with data. It uses techniques and theories drawn from many fields within the context of **mathematics, statistics, computer science, domain knowledge and information science.** It's getting considered now, data science as a "fourth paradigm" of science (empirical, theoretical, computational and now data-driven) and asserted that "everything about science is changing because of the impact of information technology" and the data flood.





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# WHY DATA SCIENCE

Data analytics, cyber security, cloud computing, virtual reality, artificial intelligence, digital marketing sectors could be emerging sectors in the IT, says experts.

Students equipped with right skills will have plenty of job opportunities in the future...

"There's no denying that 'data scientist' is a hot job title to have right now, and for good reason. It's a tremendously fun and challenging field to be in, and despite all of the often undeserved hoopla that surrounds it, data scientists are doing some pretty amazing things. So it's no surprise that many people are clamoring to find out how to become data scientists." http://treycausey.com/getting_started.html

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## List of Top 10 Highest Paying Jobs in India

- Medical Professionals (Doctors & Surgeons)
- Data Scientist.
- Machine Learning Experts.
- Blockchain **Developer**.
- Full Stack **Software Developer**.
- Product Management.
- **Management Consultant**.
- Investment Banker.

Source:
www.Upgrad.com

# PRACTICAL AND RESEARCH ORIENTED

## Job Roles in Data Science

- Data Analyst
- Data Engineers
- Database Administrator
- Machine Learning Engineer
- Data Scientist
- Data Architect
- Statistician
- Business Analyst
- Data and Analytics Manager

**Computer vision Engineer**
**AI Engineer**
**Quantitative Researcher**
**BI Developer**

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# Clarifying the Jargon

- AI, Machine Learning
- Predictive Analytics/Data Mining
- Big Data Analytics
- Data Science

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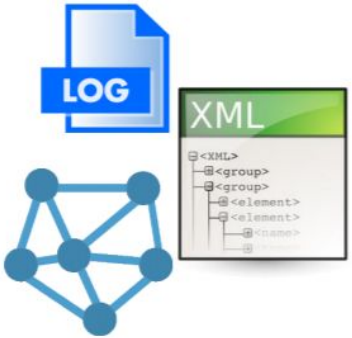
# What are various Types of data?

## Examples

Structured Data


Semi-structured Data




Unstructured Data

# Modules of Data Science

## Machine Learning Services

- Predictive Analytics
- Anomaly Detection
- Recommendation Engine
- Time Series Forecasting

## Text Analytics Services

- Natural Language Processing
- Sentiment Analysis
- Speech Recognition
- Chatbots

## Deep Learning Services

- Image/Object Recognition
- Semantic Segmentation
- Reinforcement Learning
- Geospatial Analysis

## Digital Transformation Services

- Enterprise Solutions
- Mobile Enablement
- IOT Services
- Data Analytics

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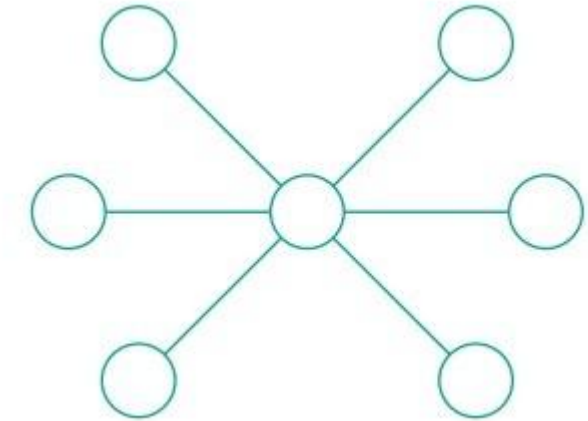
# Domain Areas

DIGITALOGISTICS

DIGITAL RETAIL

retail



aerospace

DIGITAL MANUFACTURING

DIGITAL HEALTHCARE

HEALTH CARE

DIGITAL BFSI

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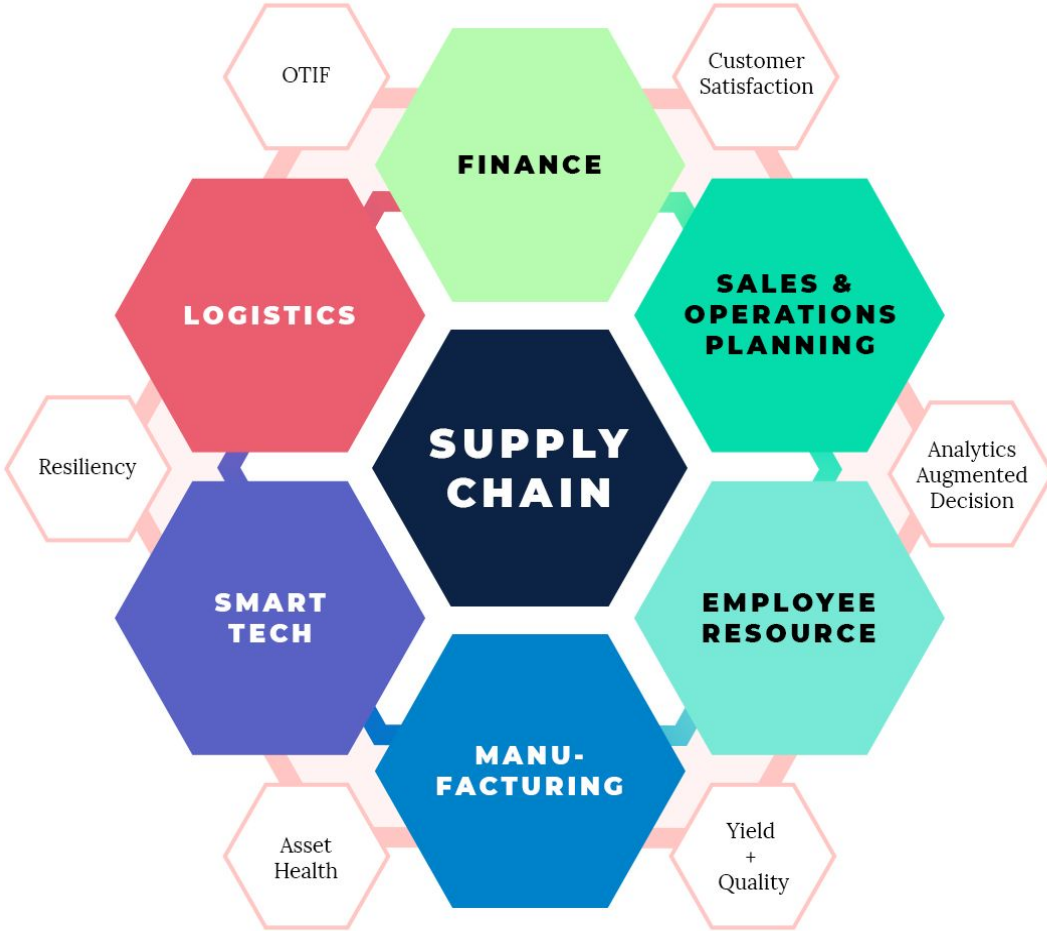
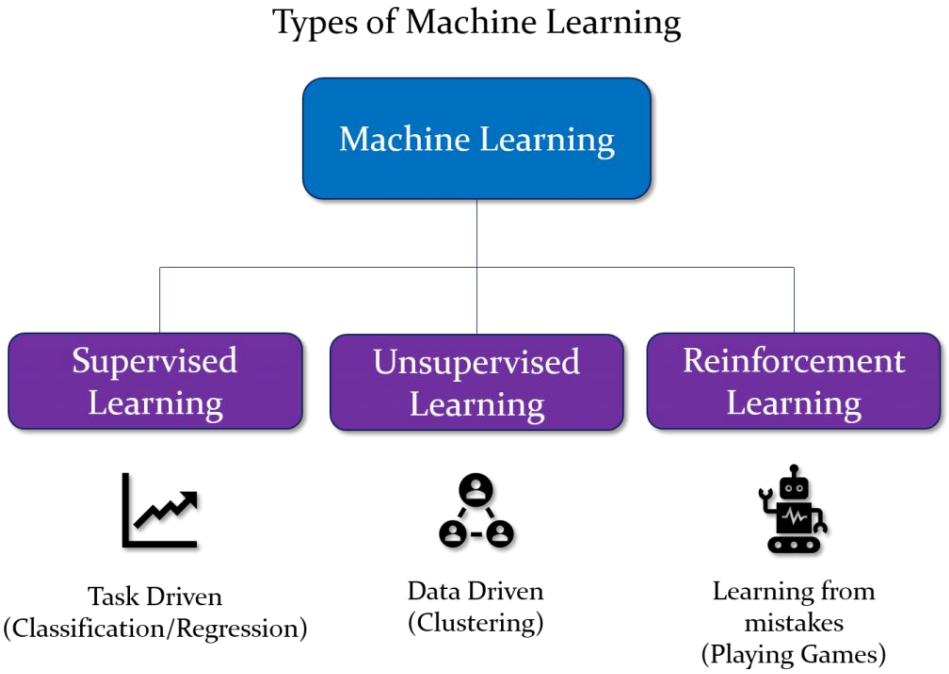



**COVERING ENTIRE CHAIN**

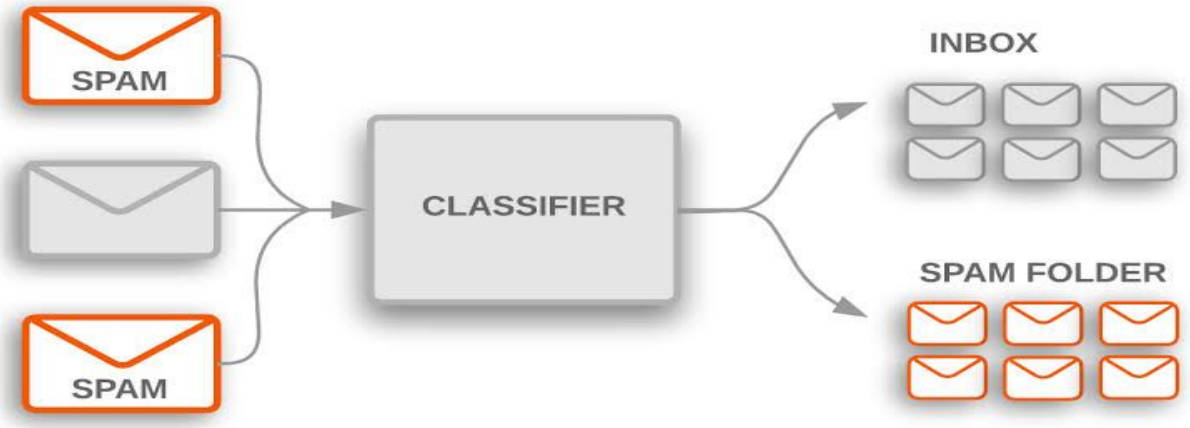
## MACHINE LEARNING (LEARNING FROM PAST EXPERIENCE)

Machine learning is the study of computer algorithms that improve automatically through experience. It is seen as a subset of artificial intelligence.



## E-mail classification using Machine Learning

**Use Case:** With the help of Machine Learning the Emails all over the Internet are classified as Spam or Important based on the action taken by the users previously.



## PREDICTIVE and FORECASTING ANALYTICS

Constantly monitoring transmission lines in order to determine patterns and predict future outcomes and trends.

**Use Case :** To accurately predict power demand in the Electric Industry.
Understand point of maintenance.

## RECOMMENDATION ENGINE

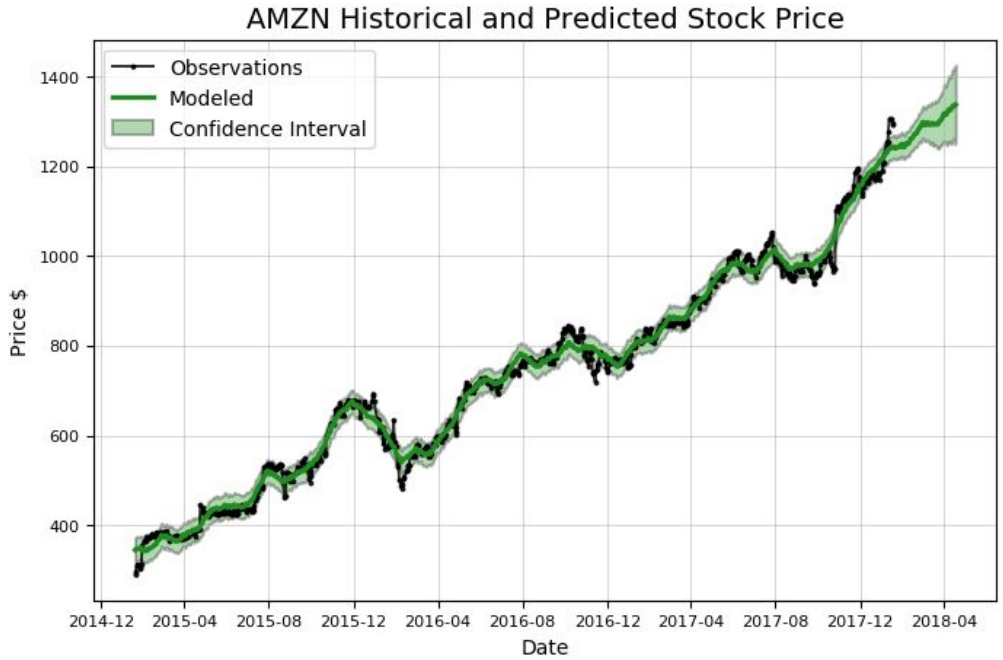
Using this, the system can provide Suggestions to Users for something he might be interested in, by tracing the Previous Activity of the user and also the Activity of Similar kind of Users.

**Use Case :** Amazon uses recommendation engine to suggest related products to users**.**

## TIME SERIES FORECASTING

A time series is a sequence of observations taken sequentially in time. It involves fitting a model on historical data and using them to predict future observations.

**Use Case :** Stock Market Trend Prediction.

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**DEEP LEARNING (Enhanced form of Machine learning)**

- It imitates the workings of the **human brain** in processing data and creating patterns with the help of **Artificial Neural Networks.**

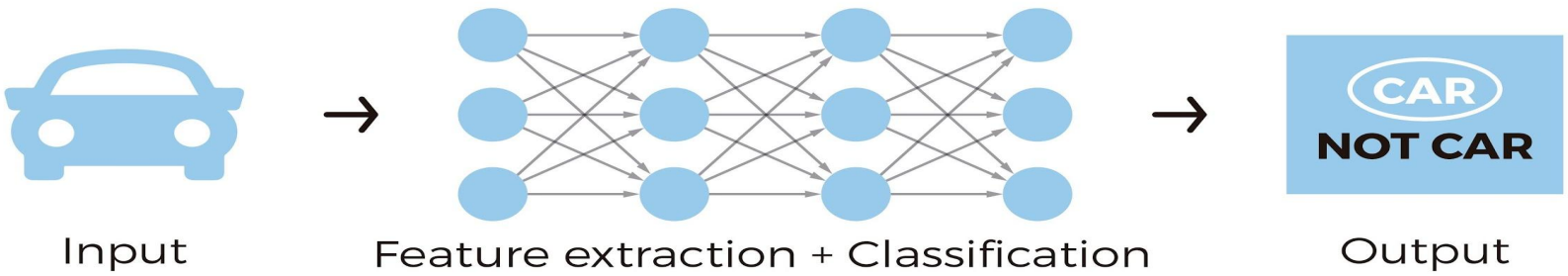
- It **learns from vast amounts** of **unstructured data** that would normally take humans decades to understand and process.

  Meaning:

- **Deep learning** is an AI function that mimics the workings of the human brain in processing data for use in detecting objects, recognizing speech, translating languages, and making decisions. **Deep learning** AI is able to **learn** without human supervision, drawing from data that is both unstructured and unlabeled
- Deep Learning do need need a human effort to take out features from the data just like machine learning. It does it own feature extraction and then classifies it accordingly.

# Machine Learning


# Deep Learning

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## Natural Language Processing (NLP)

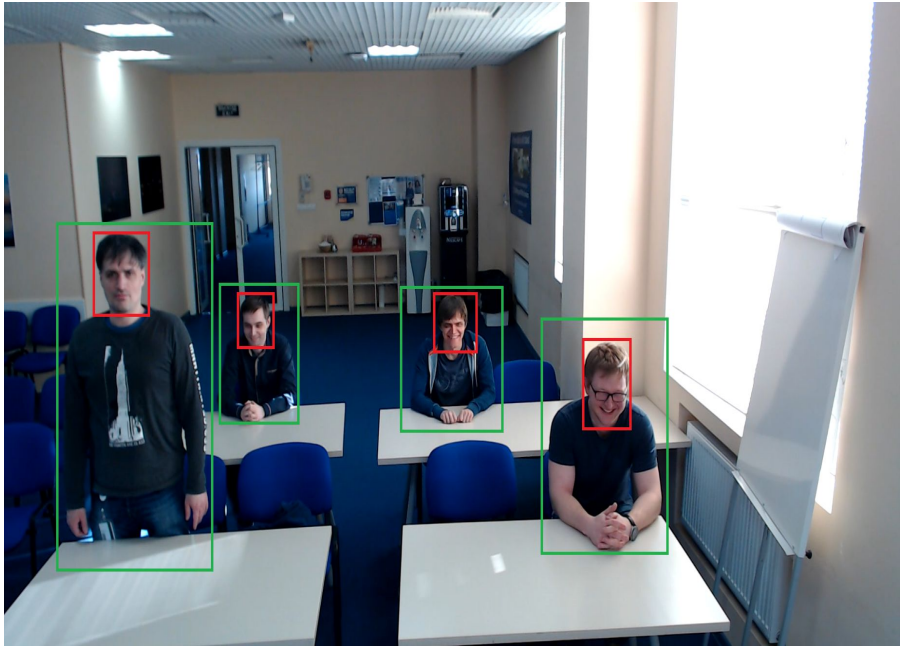
It is the ability of the system to Understand Human Language as it is Spoken by Humans. **Syntax** (arrangement of words) and **Semantic Analysis** (meaning behind words) are the two main techniques of NLP.

**Use Case :** Used by Virtual Assistants like Siri , Alexa, Google Assistant.
Sentiment Analysis, Chat Bots.

## IMAGE AND OBJECT RECOGNITION

This is the process of detecting the image and  further recognizing the image and then classifying it.

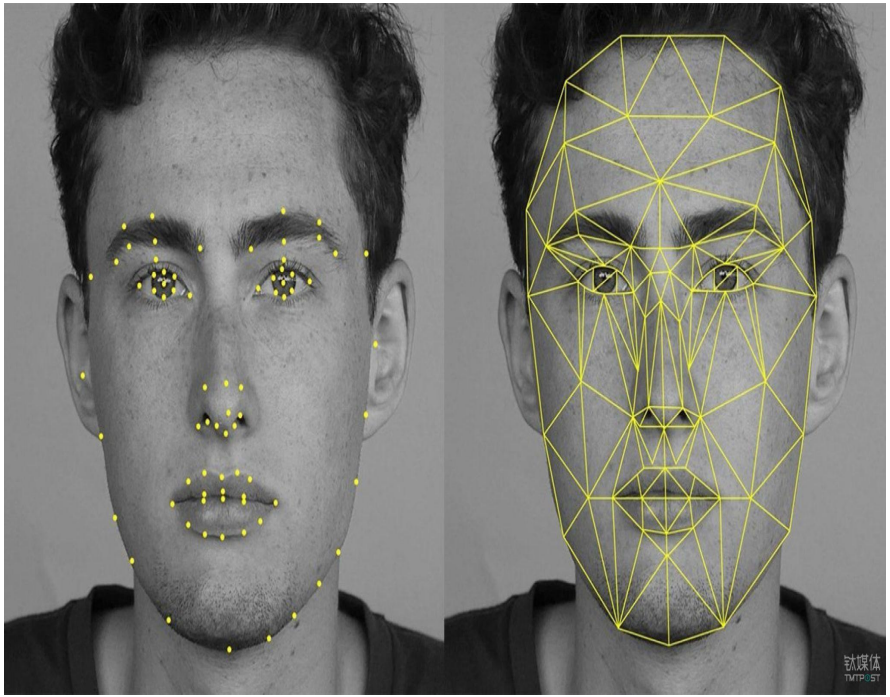
**Use Case :** Detection: Human, No. plate, FASTAG and many more …..



## SEMANTIC SEGMENTATION

Semantic Segmentation means understanding what's in the image in Pixel level thereby Differentiating all the objects and Categorizing them for clear and better understanding of the image

**Use Case :** Detecting the Facial Expressions, Mask Detection, Face Detection unlock and many more...

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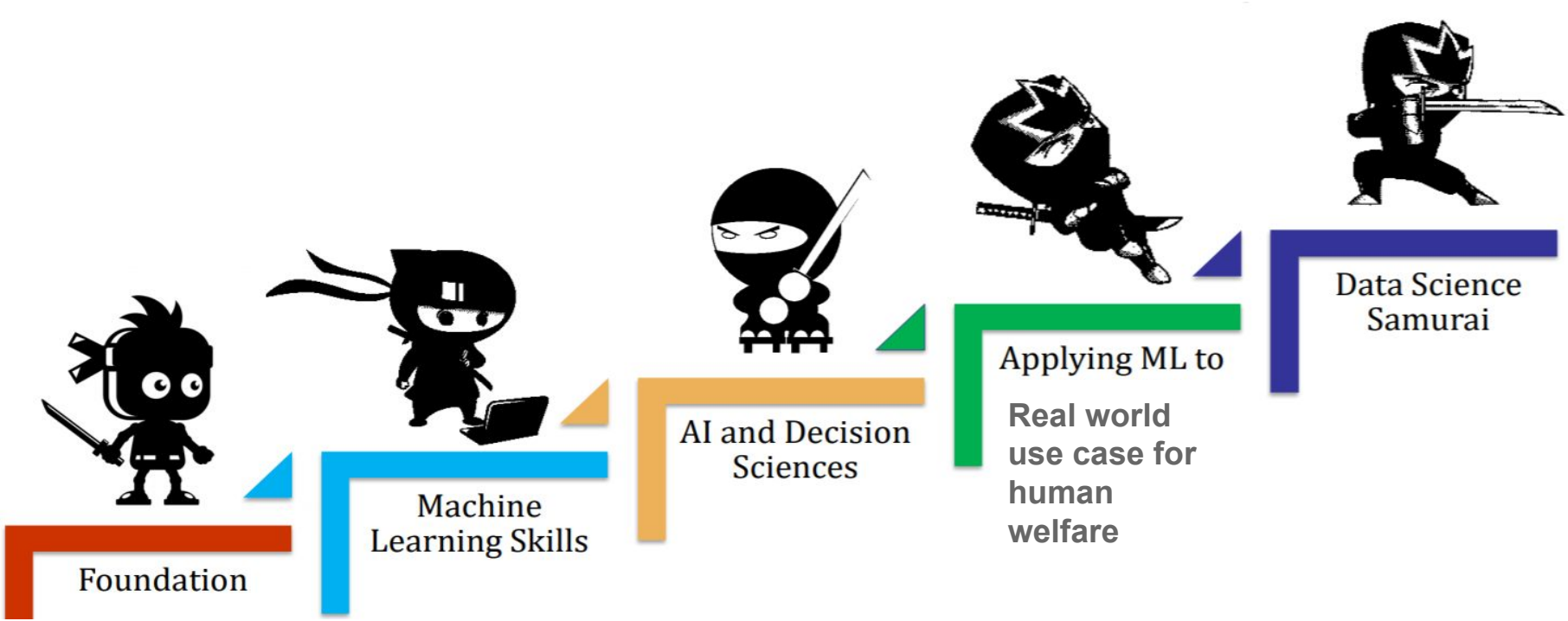
# Road Map to Become a Data Science Samurai

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# THANK YOU

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