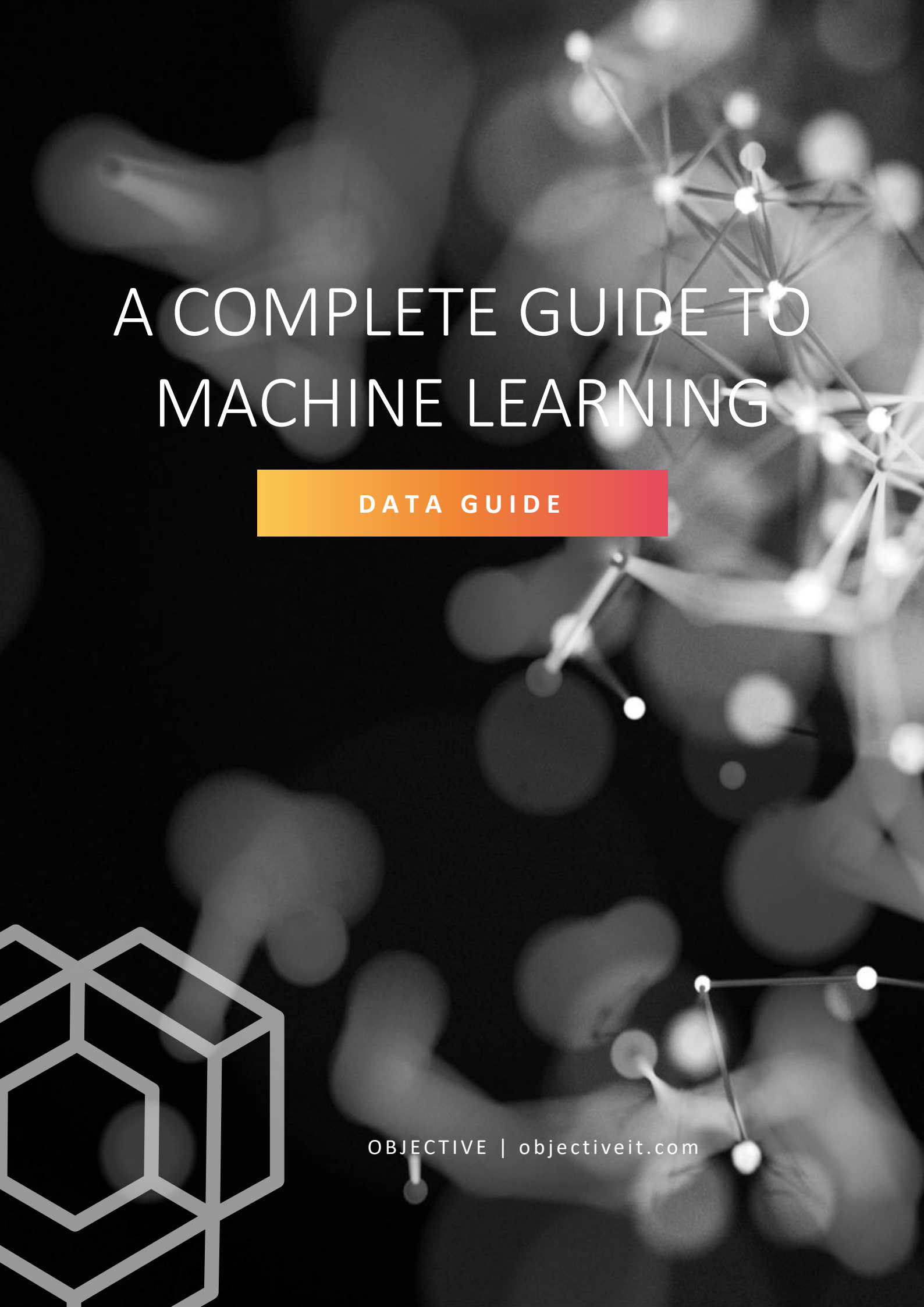


A COMPLETE GUIDE TO MACHINE LEARNING

DATA GUIDE

OBJECTIVE | objectiveit.com

USES OF MACHINE LEARNING

This powerful tech is becoming ever more widespread in use - here are some everyday uses:

- Chatbots - these are common on websites and through other online applications such as surveys and enquiry handling.
- Automotive technology - the much-vaunted self-drive car features Machine Learning
- Image recognition - security face detection and automated passport scanners use this.
- Autocorrect - used extensively to correct spelling and grammar.
- Spam detection - used in email packages such as Gmail to isolate spam emails.
- Financial - to detect fraud by analysing regular usage compared to irregular usage of financial websites and payment systems. Also used for assessing risk such as when someone applies for a financial product.
- Medical - used for detection and diagnosis of medical conditions.

In general, Machine Learning is training systems and machines to think like humans and show similar intelligence - and of course it can reduce manual handling of tasks considerably.

HOW DOES MACHINE LEARNING WORK?

The huge amounts of data gathering by businesses and organisations of all types means Machine Learning is rapidly growing in use, these are the steps in creating a Machine Learning model:

Collecting data - systems and machines learn from information fed to them, so good quality reliable data is vital to achieve maximum accuracy.

Preparing data - careful and thorough data preparation is vital to ensure it is 'clean' enough to be used, so removing duplicate or missing values is important and both a training and testing data set have to be created. The training set is used by your system to learn, and the testing set is used to check the accuracy of the model created.

Modelling - creating the relevant model is important depending on the task in question, so various models such as speech or image recognition, predictive text and so forth are required.

Training - next, the model has to be trained: you give the data to the Machine Learning model you have created so the system can find patterns and make predictions by learning from the data. Over time the model becomes more accurate in its predictions.

Evaluation - after training is complete, evaluating how well your model is performing is achieved using the test data referred to earlier - effectively 'fresh' data the system hasn't seen before.

Tuning - where any improvements in accuracy may be implemented once training and evaluation has taken place.

Implementation - once the above process has been completed, the model can now be relied on to make predictions based on new data you present it with.

THE FOUR MAIN TYPES OF MACHINE LEARNING

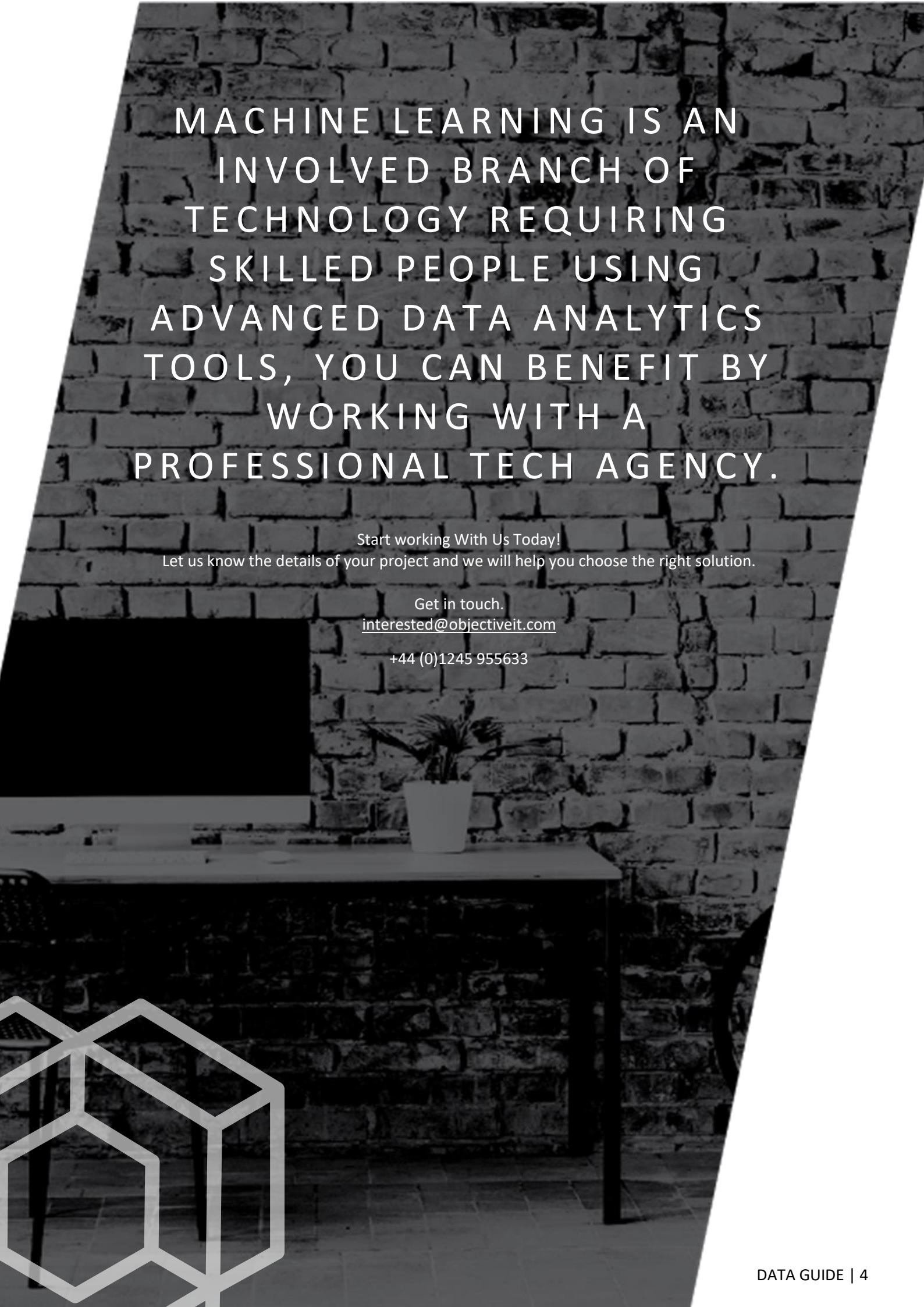
- Supervised learning
- Unsupervised learning
- Reinforcement learning
- Deep learning

Supervised learning - machine learning in which an algorithm learns from a dataset comprising both input and output data, allowing the algorithm to learn from the relationship between them. Examples of supervised learning include image classification, speech recognition, and spam detection.

Unsupervised learning - machine learning where an algorithm learns from input data only unlike supervised learning above. The algorithm's goal is to simply find patterns in the data. Examples of unsupervised learning include Amazon's "you might also be interested in" product choices when perusing a sales page.

Reinforcement learning - where the machine learns by interacting with an environment and is given free rein to make its own choices and receives feedback in the form of rewards or penalties depending on whether or not it leads to a desired outcome. The process is repeated multiple times so the machine learns through repetition and basic trial and error. Examples of reinforcement learning include game playing and recommendation systems (like the Amazon example).

Deep learning - a more advanced form of learning breaking tasks down into layers: loosely based on how neurons work in the human brain.
Deep learning takes Machine Learning into the realms of speech recognition, and powers Siri and Google Assistant along with some face recognition systems and self-driving car tech.



MACHINE LEARNING IS AN INVOLVED BRANCH OF TECHNOLOGY REQUIRING SKILLED PEOPLE USING ADVANCED DATA ANALYTICS TOOLS, YOU CAN BENEFIT BY WORKING WITH A PROFESSIONAL TECH AGENCY.

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