

# Machine Learning Roadmap



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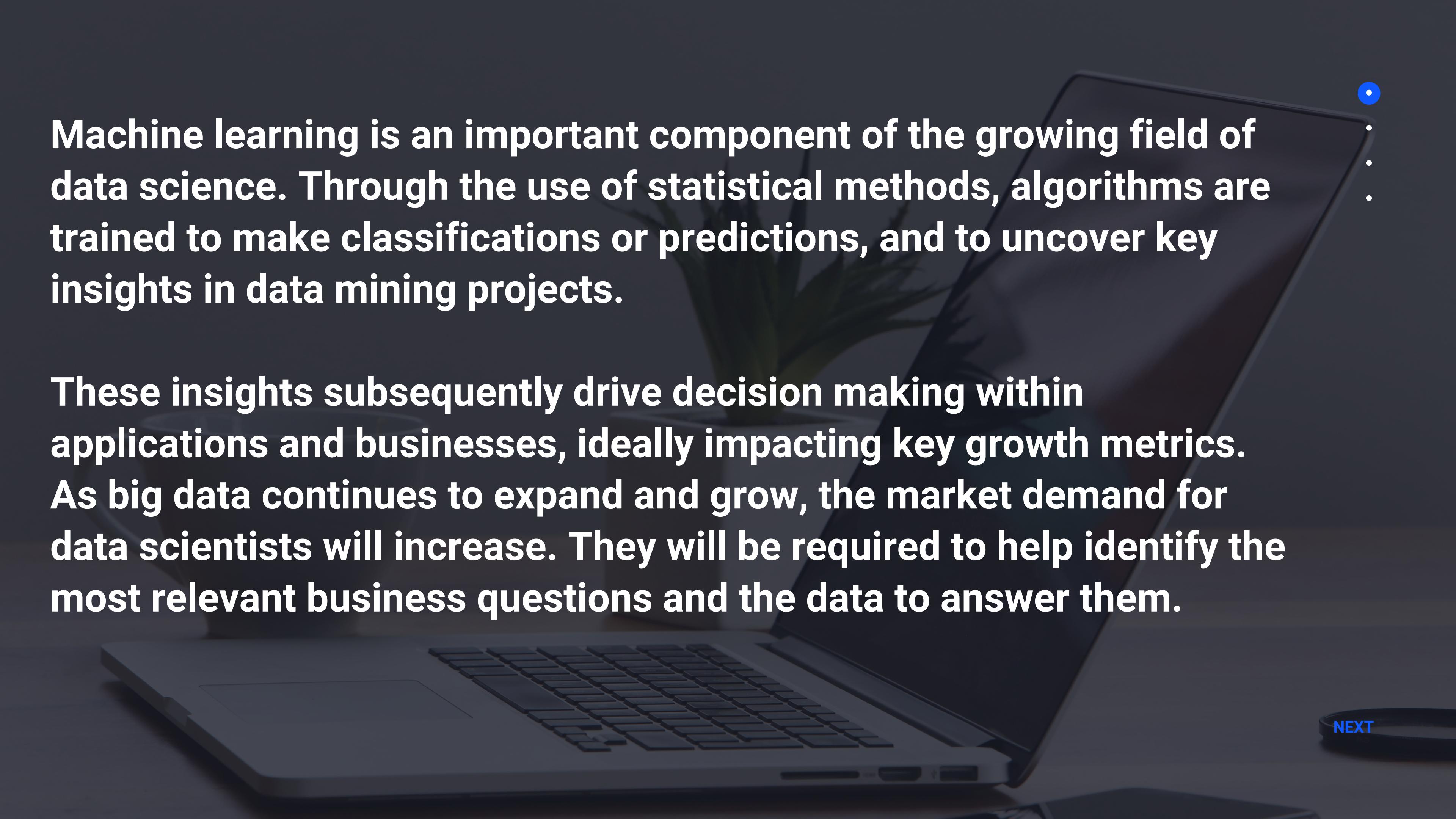
Open Source Contributor



## WHAT IS MACHINE LEARNING

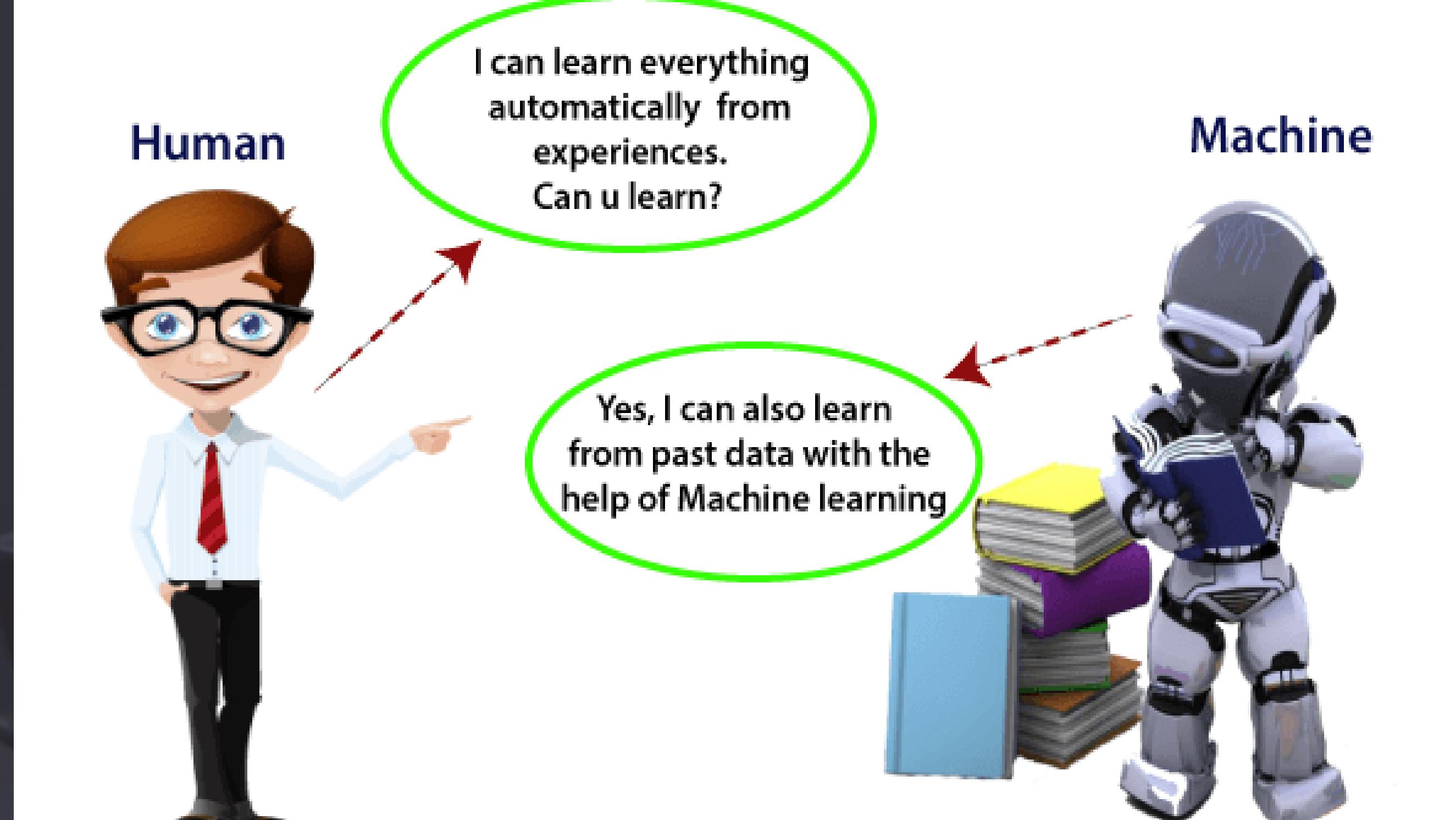
Machine learning is a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy.

NEXT



Machine learning is an important component of the growing field of data science. Through the use of statistical methods, algorithms are trained to make classifications or predictions, and to uncover key insights in data mining projects.

These insights subsequently drive decision making within applications and businesses, ideally impacting key growth metrics. As big data continues to expand and grow, the market demand for data scientists will increase. They will be required to help identify the most relevant business questions and the data to answer them.



**Machine learning enables a machine to automatically learn from data, improve performance from experiences, and predict things without being explicitly programmed.**

NEXT

## FEATURE OF MACHINE LEARNING

### Features of Machine Learning:

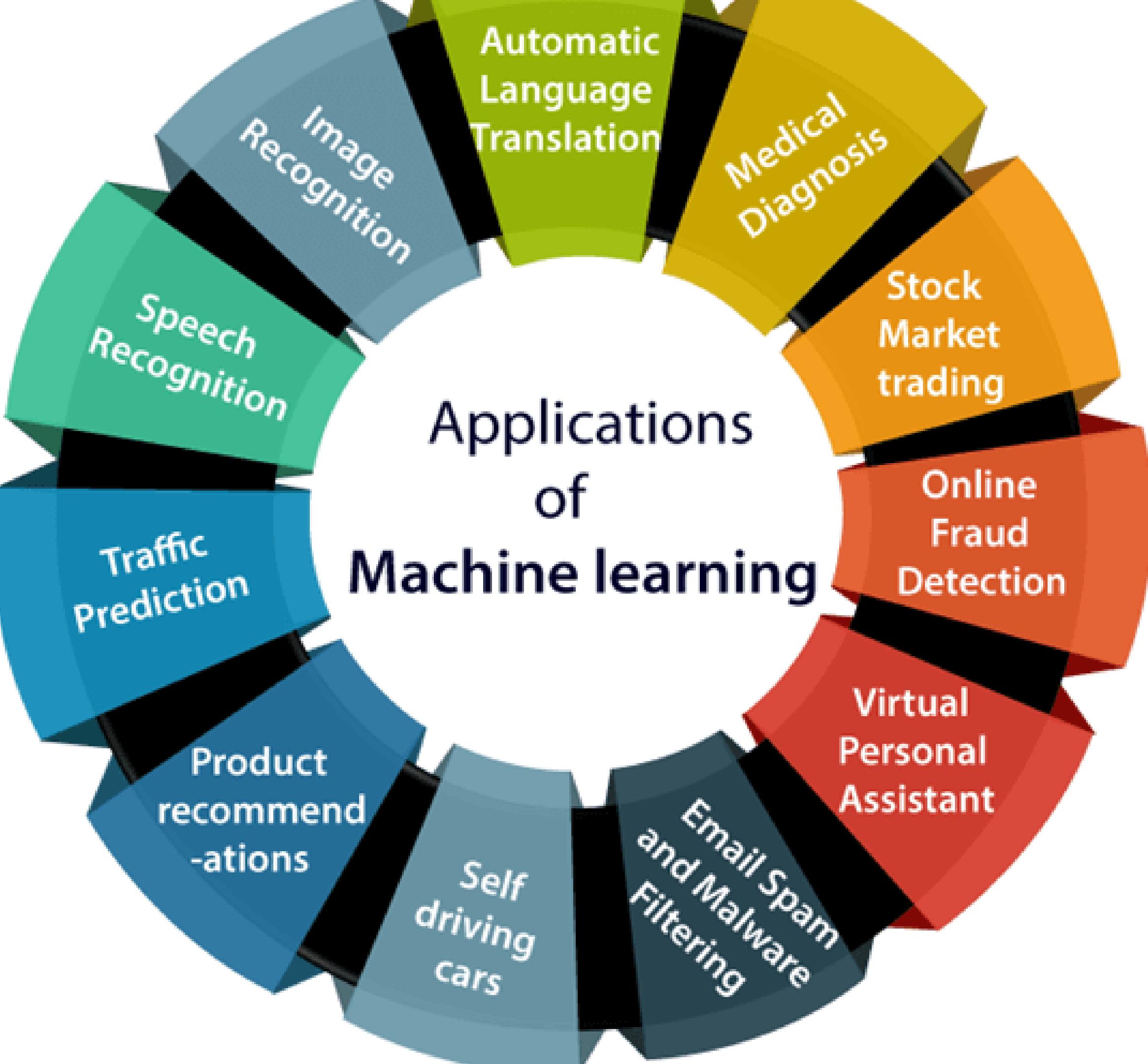
- Machine learning uses data to detect various patterns in a given dataset.
- It can learn from past data and improve automatically.
- It is a data-driven technology.
- Machine learning is much similar to data mining as it also deals with the huge amount of the data.

NEXT

We can train machine learning algorithms by providing them the huge amount of data and let them explore the data, construct the models, and predict the required output automatically. The performance of the machine learning algorithm depends on the amount of data, and it can be determined by the cost function.

The importance of machine learning can be easily understood by its uses cases, Currently, machine learning is used in self-driving cars, cyber fraud detection, face recognition, and friend suggestion by Facebook, etc.

Various top companies such as Netflix and Amazon have build machine learning models that are using a vast amount of data to analyze the user interest and recommend product accordingly.



# Applications of Machine learning

Automatic  
Language  
Translation

Medical  
Diagnosis

Stock  
Market  
trading

Online  
Fraud  
Detection

Virtual  
Personal  
Assistant

Email Spam  
and Malware  
Filtering

Self  
driving  
cars

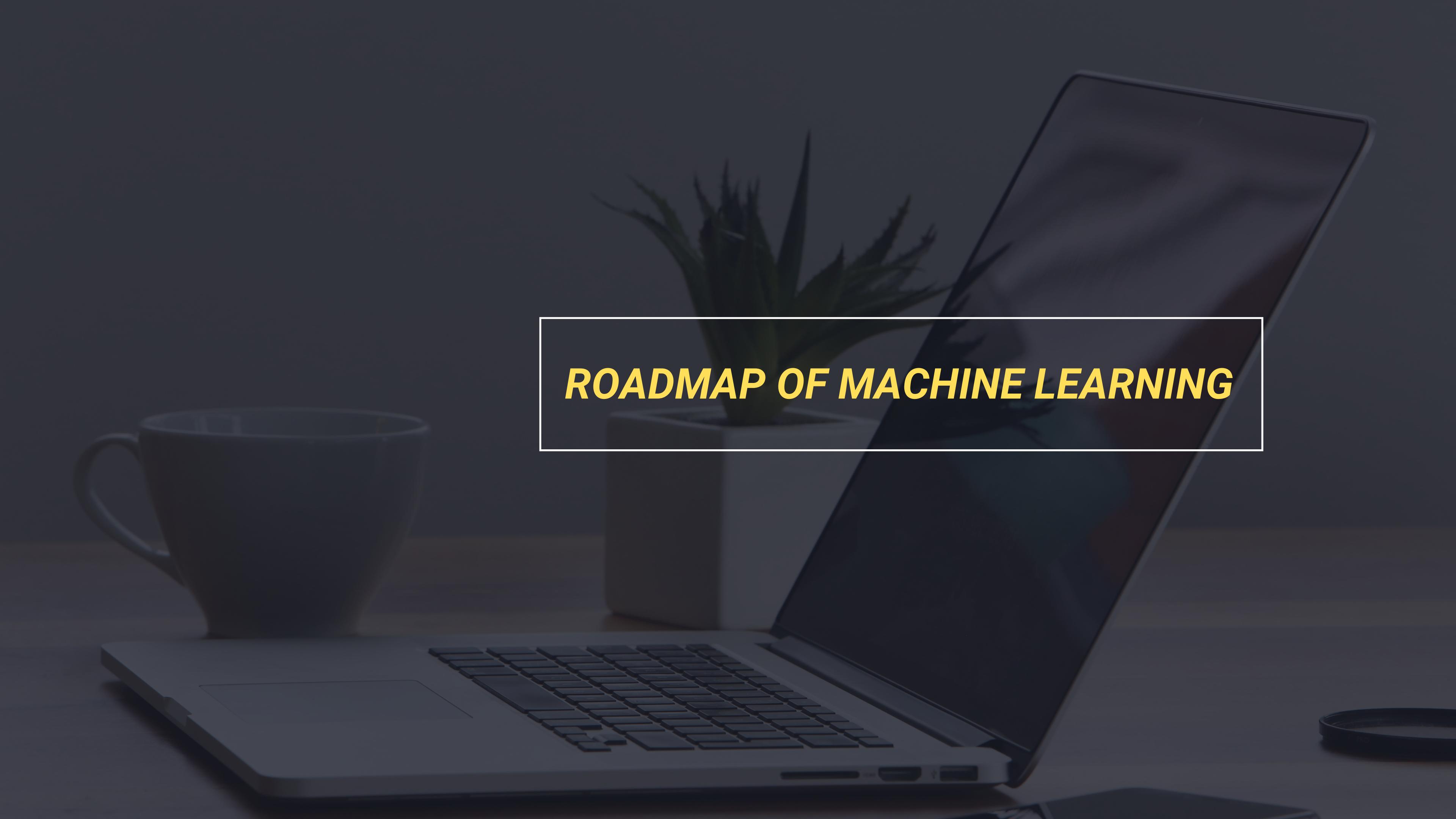
Image  
Recognition

Speech  
Recognition

Traffic  
Prediction

Product  
recommend  
-ations

NEXT

The background of the image is a dark, moody photograph of a laptop keyboard, a cup of coffee, and a plant.

# **ROADMAP OF MACHINE LEARNING**

# 1- PROGRAMMING LANGUAGE

PYTHON

R

A photograph showing a close-up of a person's hands typing on a dark-colored laptop keyboard. To the left of the keyboard, a white paper coffee cup with a lid is visible. The background is dark and out of focus.

# EXPLORATORY DATA ANALYSIS

A photograph showing a close-up of a person's hands typing on a black computer keyboard. To the left of the keyboard, a white paper coffee cup with a lid is visible. The background is dark and out of focus.

# FEATURE ENGINEERING

- 1-EDA
- 2-HANDLING MISSING VALUE
- 3-HANDLING OUTLIER
- 4-CATEGORICAL ENCODING
- 5-NORMALIZATION AND  
STANDARDIZATION

A photograph showing a close-up of a person's hands typing on a dark-colored computer keyboard. To the left of the keyboard, a white paper coffee cup with a lid is visible. The background is dark and slightly blurred.

# FEATURE SELECTION

- 1-CORRELATION
- 2-FORWARD ELIMINATION
- 3-BACKWARD ELIMINATION
- 4-UNIVARIATE SELECTION
- 5-RANDOM FOREST IMPORTANCE
- 6-FEATURE SELECTION WITH DECISION TREE

A photograph showing a close-up of a person's hands typing on a dark-colored computer keyboard. To the left of the keyboard, a white paper coffee cup with a lid is visible. The background is dark and out of focus.

# MACHINE LEARNING ALGORITHM

REGRESSION  
CLASSIFICATION  
CLUSTERING

A photograph showing a close-up of a person's hands typing on a dark-colored computer keyboard. To the left of the keyboard, a white paper coffee cup with a lid is visible. The background is dark and out of focus.

ALGORITHMS LIKE  
*LINEARN REGRESSION, LOGISTIC  
REGRESSION, DECISION TREE, RANDOM  
FOREST, XGBOOST, KMEANS, DBSCAN*



# HYPERPARAMETER TUNING

## GRID SEARCH , RANDOMISED SEARCH, HYPEROPT, OPTUNA, GENETICS ALGORITHM

A photograph showing a close-up of a person's hands typing on a black computer keyboard. In the upper left corner of the slide, there is a semi-transparent dark overlay. In the top left corner of this overlay, a white paper coffee cup with a lid is visible. The main title text is positioned in the center of the slide.

# Model Deployments

To host your machine learning models with a powerful backend, you will need to learn frameworks like Django and Flask.

**Docker** and **Kubernetes** can be of great help if you want to ship and deploy your models quickly!

**Streamlit** is worthy of looking into if you wish to build custom web apps for machine learning and data science

A photograph showing a close-up of a person's hands typing on a dark-colored computer keyboard. To the left of the keyboard, a white paper coffee cup with a lid is visible. The background is slightly blurred, suggesting an office or workspace environment.

# Cloud Understanding-

## AWS

## AZURE

## GCP

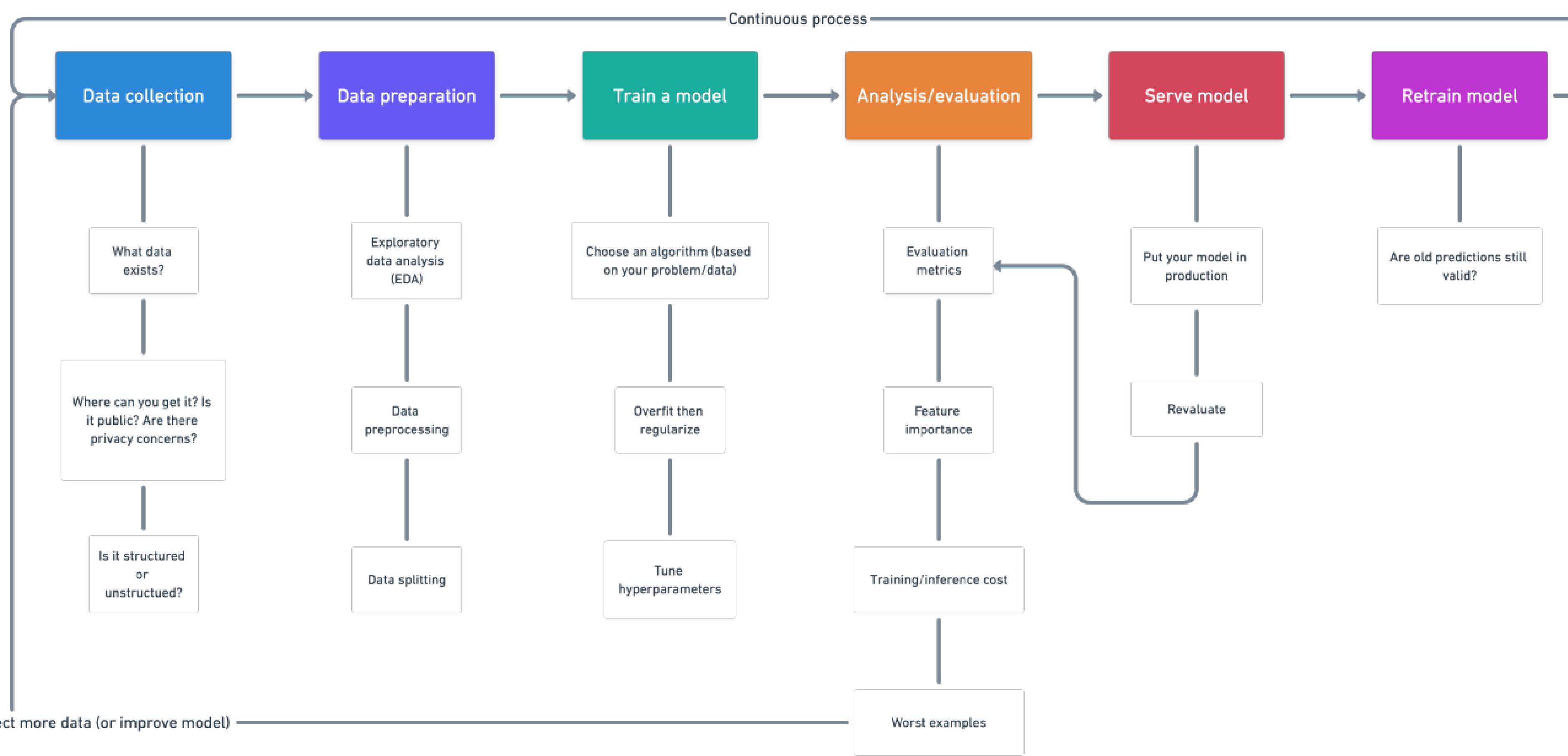
## HEROKU

A photograph showing a close-up of a person's hands typing on a dark-colored computer keyboard. To the left of the keyboard, a white paper coffee cup with a lid is partially visible. The background is dark and out of focus.

# END TO END ML PROJECTS

- **SOME BEGINNER ML PROJECT INCLUDES**

- Iris Flowers Classification
- Stock Prices Predictor
- Predicting Wine Quality ( Wine Quality Dataset)
- MNIST Handwritten Digit Classification
- Movie Recommender System
- Boston House Pricing Prediction Project



# Frame work for ML

NUMPY

DASK

MATPLOTLIB

SCIPY

SEABORN

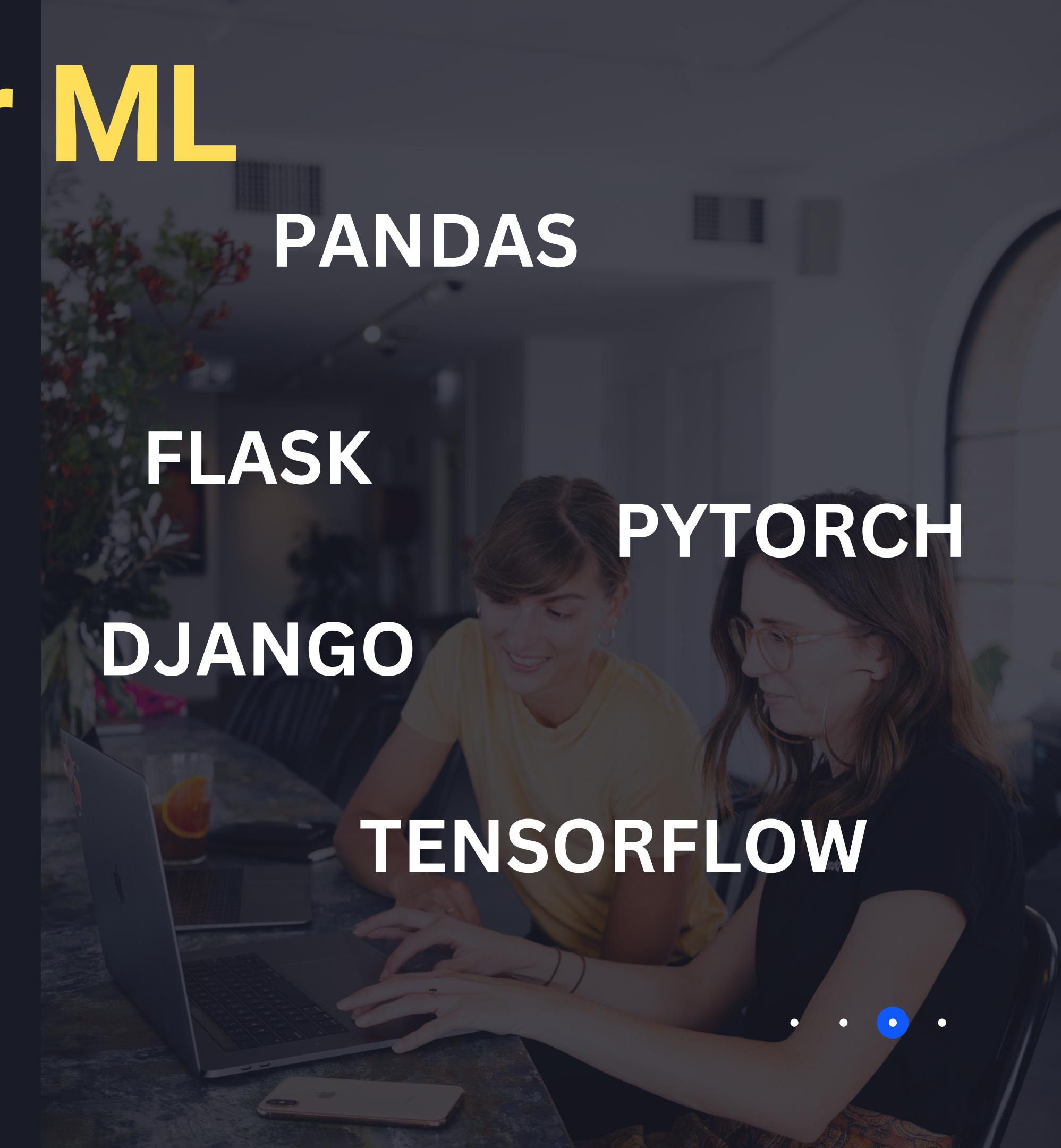
PANDAS

FLASK

DJANGO

TENSORFLOW

PYTORCH



# FRAMEWORK FOR WEB DEVELOPMENT

WEB2PY

TURBOGREEN

FLASK

CHERRYPY

DJANGO

# • Resources

**Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems**

[https://www.amazon.in/Hands-Machine-Learning-Scikit-Learn-Tensor/dp/9352139054/ref=sr\\_1\\_1?  
crid=2ZIGJ7RDJBZYA&dchild=1&keywords=hands+on+ml+with+scikit+learn%2C+keras+and+tensorflow&qid=1611  
033246&sprefix=hands+on+ml%2Ccomputers%2C305&sr=8-1](https://www.amazon.in/Hands-Machine-Learning-Scikit-Learn-Tensor/dp/9352139054/ref=sr_1_1?crid=2ZIGJ7RDJBZYA&dchild=1&keywords=hands+on+ml+with+scikit+learn%2C+keras+and+tensorflow&qid=1611033246&sprefix=hands+on+ml%2Ccomputers%2C305&sr=8-1)

**Machine Learning Crash Course**

[https://developers.google.com/machine-  
learning/crash-course](https://developers.google.com/machine-learning/crash-course)

NEXT



# Machine Learning Resources

[dbourke.link/mlcourse](http://dbourke.link/mlcourse)

Beginner (3-6 months+)

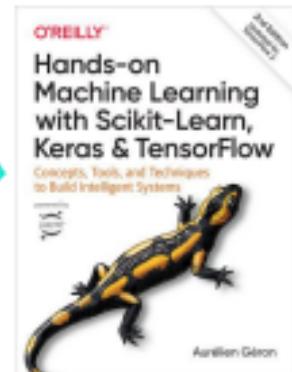


Machine Learning Concepts  
(get your mind ready)



Learn within  
Jupyter (or Colab)

Part 1



NumPy

pandas



Milestone project 1

Advanced (6-12 months+)



fast.ai Deep Learning for Coders (part 1)



fast.ai Deep Learning from the foundations (part 2)



TensorFlow in Practice



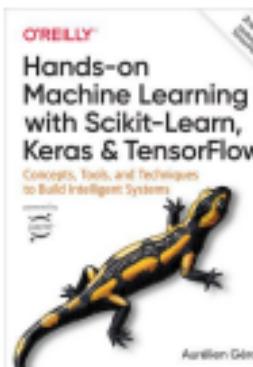
Deep Learning Specialization



Full Stack Deep Learning



Milestone project 2 (deployed)



Part 2

Bonus (sprinkle in)

[./missing-semester \(+\)](#)

The missing part of your  
CS degree

Choose one



AWS



Google Cloud



Microsoft Azure

[freeCodeCamp \(↗\)](#)

Web Development



Khan Academy

Math when needed



arXiv.org



Implement a paper



git

Version control

NEXT

A group of diverse people are gathered in an office setting, smiling and shaking hands. In the foreground, a man in a grey sweater and a woman in a tan blazer are shaking hands. Behind them, two other women are engaged in conversation. The background features a window with a grid pattern.

Thank you!

