

IEEE Nigeria

# Building a Career in AI and Machine Learning

**Presented by**  
**Jean de Dieu Nyandwi**

**August 18, 2021**

# Careering in AI and Machine Learning

**Jean de Dieu Nyandwi**



@Jeande\_d



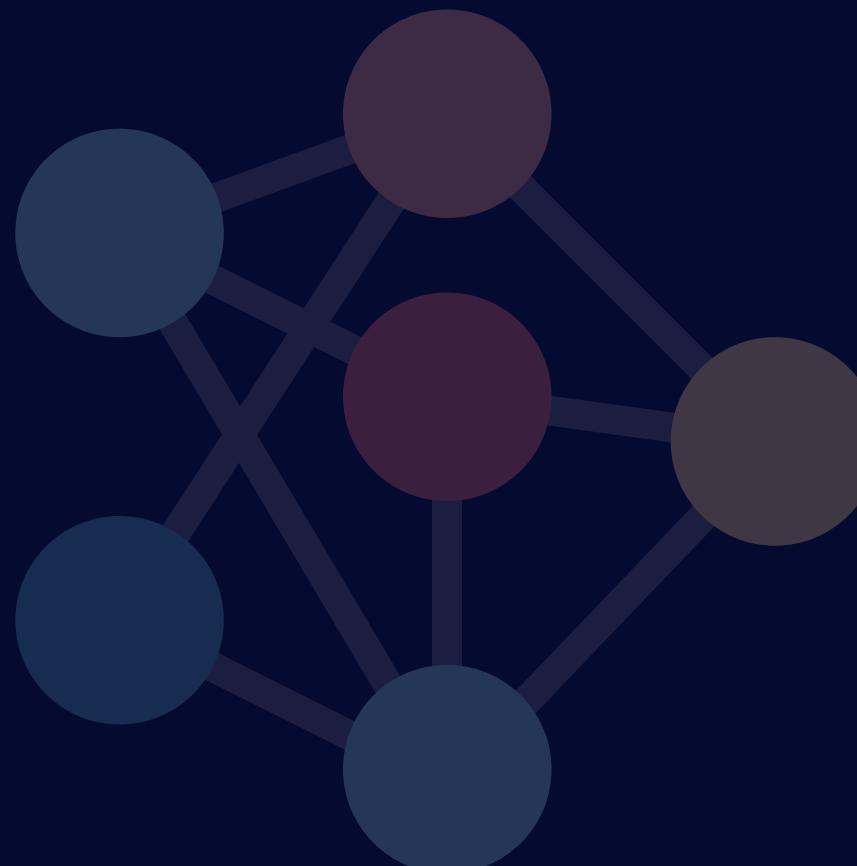
nyandwi



jeande.tech

# Agenda

What we'll learn today



01

What is AI and ML?

02

Careers in AI

03

Learning  
What's Next

**What is AI  
And  
Machine  
Learning?**

# AI | Machine Learning | Deep Learning

## Artificial Intelligence

AI is used to describe a computer which can mimic the human behavior (learning & problem solving)



# AI | Machine Learning | Deep Learning

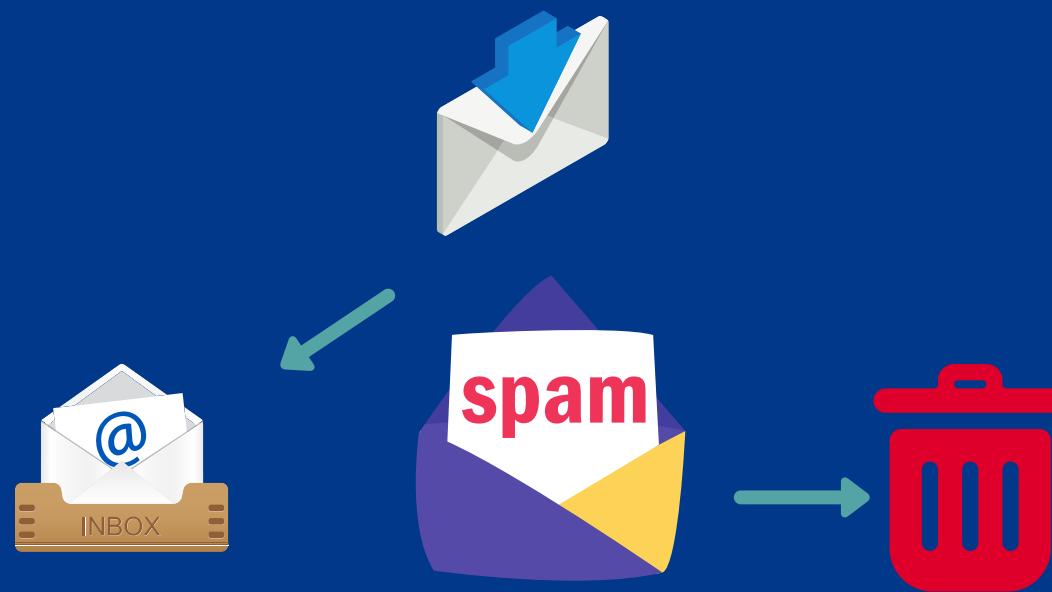
## Artificial Intelligence

AI is used to describe a computer which can mimic the human behavior (learning & problem solving)



## Machine Learning

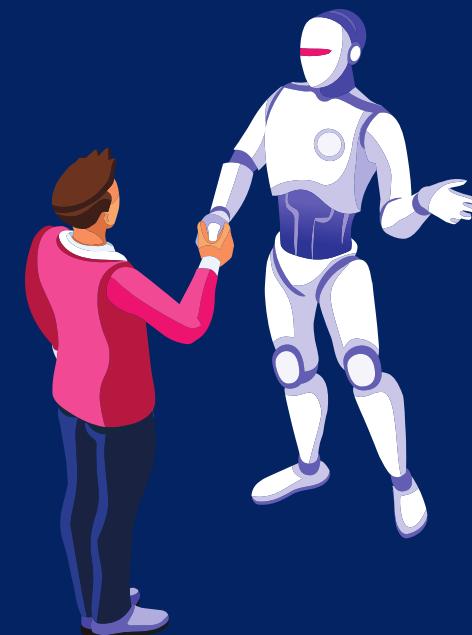
This is the ability of machine to learn without being explicitly programmed



# AI | Machine Learning | Deep Learning

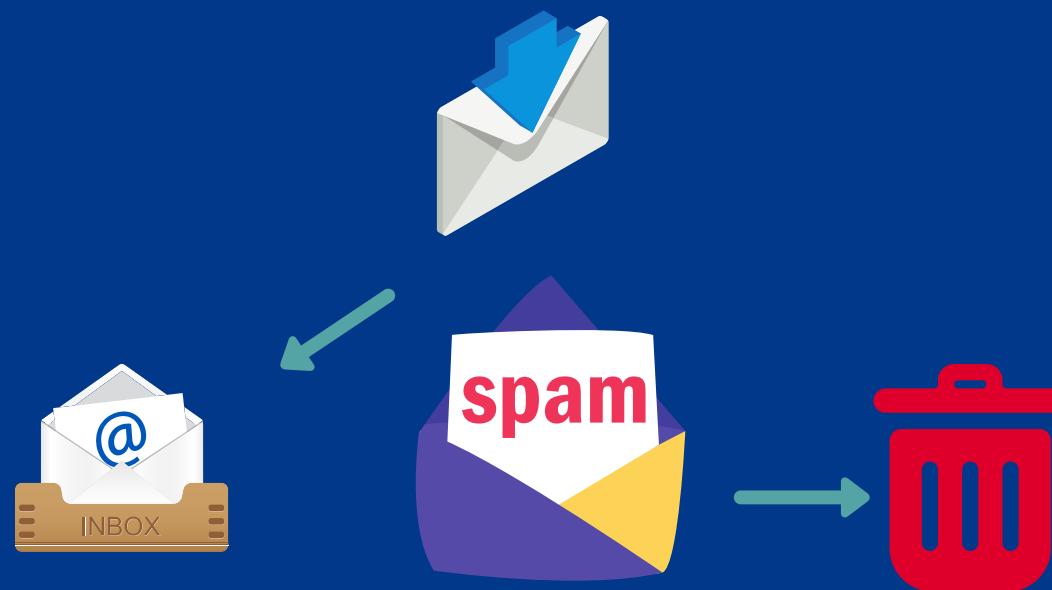
## Artificial Intelligence

AI is used to describe a computer which can mimic the human behavior (learning & problem solving)



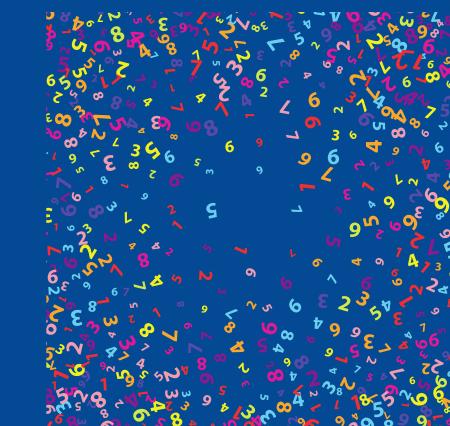
## Machine Learning

This is the ability of machine to learn without being explicitly programmed



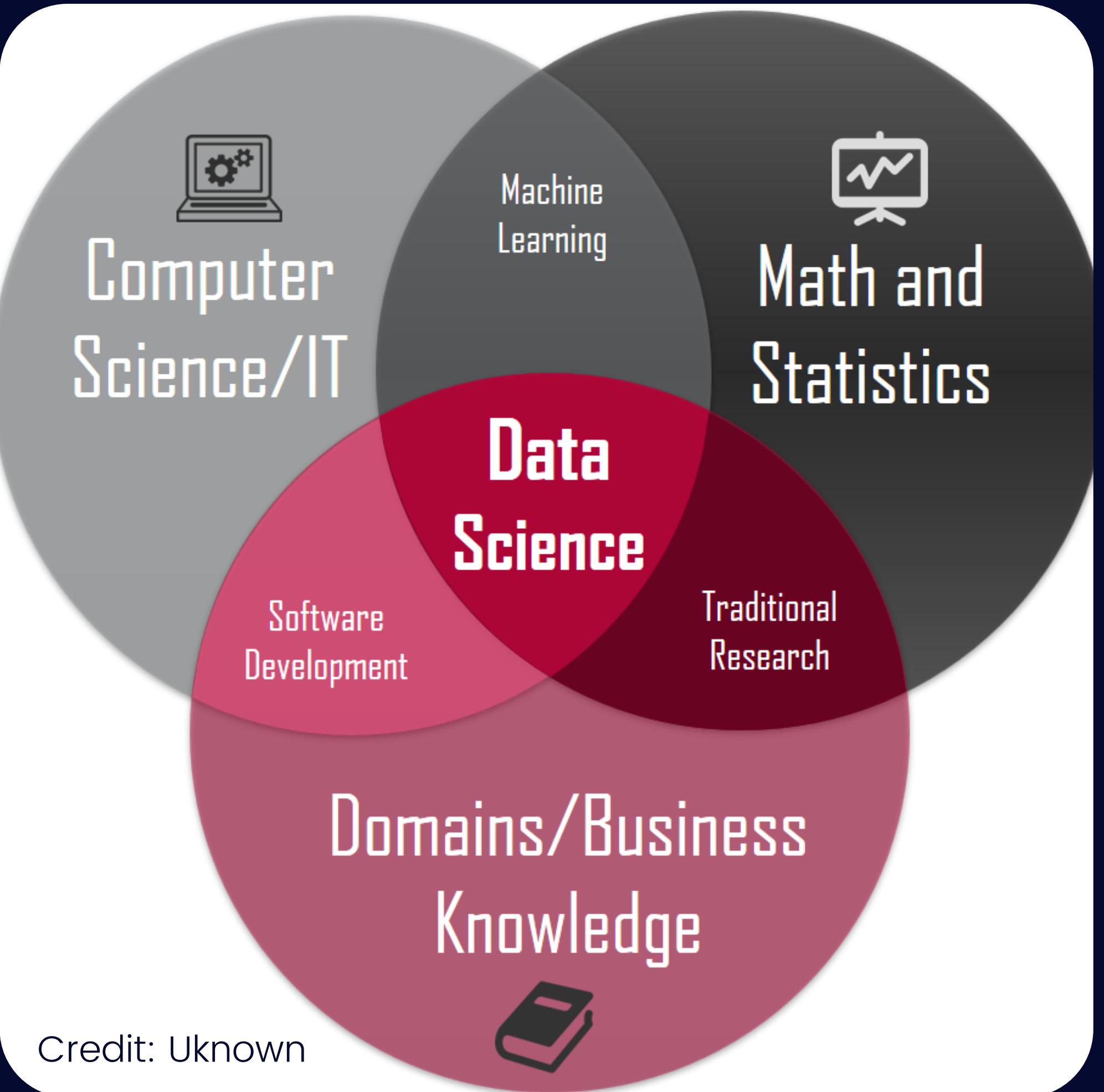
## Deep Learning

Extracting the patterns in data using artificial neural networks



Data Science is the  
science of making  
data useful.

Cassie Kozyrkov



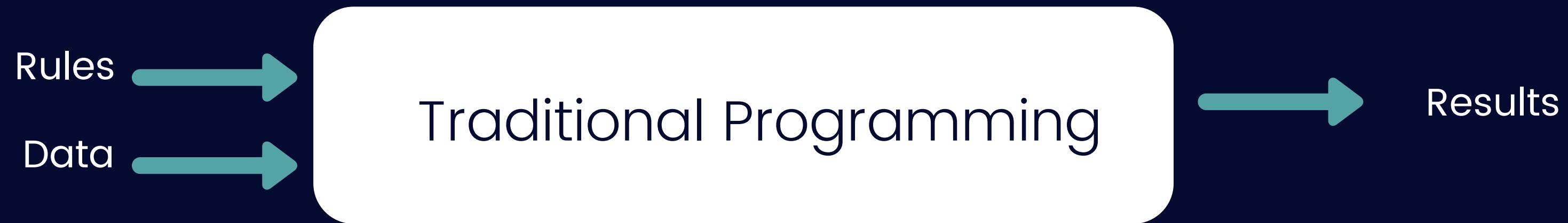
Data Science is the  
science of making  
data useful.

Cassie Kozyrkov

**The fundamental difference  
between Machine Learning and  
traditional programming is that ML  
relies on  
data.**

**And traditional programming  
relies on  
rules.**

# Traditional programming rely on rules...



# But Machine Learning relies on data.



# EXAMPLE

Car and Truck  
Recognition

Given an image of car and truck,  
how can a machine recognize what's in image?



One could hard code the program that  
can recognize them, but how efficient  
would the program be?

```
$(window).scrollTop() > header1_initialDistance) {  
    if (parseInt(header1.css('padding-top'), 10) <= header1_initialPadding) {  
        header1.css('padding-top', '' + $(window).scrollTop());  
    } else {  
        header1.css('padding-top', '' + header1_initialPadding);  
    }  
}  
  
if ($(window).scrollTop() > header2_initialDistance) {  
    if (parseInt(header2.css('padding-top'), 10) <= header2_initialPadding) {  
        header2.css('padding-top', '' + $(window).scrollTop());  
    } else {  
        header2.css('padding-top', '' + header2_initialPadding);  
    }  
}
```



# Will the program be able to recognize all sorts of cars and trucks available in world?



It's pretty clear that you would struggle  
hardcoding an efficient program that can  
recognize different kinds of car and trucks.

Machine Learning is well suited for those  
complex tasks that can not be accomplished by  
traditional programming

# Example 2: Activity Recognition



```
if speed <=4:  
    status=Walking
```

# Example 2: Activity Recognition



```
if speed <=4:  
    status=Walking
```



```
if speed <=4:  
    status=Walking  
  
else:  
    status=Running
```

# Example 2: Activity Recognition



```
if speed <=4:  
    status=Walking
```



```
if speed <=4:  
    status=Walking
```



```
if speed <=4:  
    status=Walking
```

```
else:  
    status=Running
```

```
elif speed<12:  
    status=Running
```

```
else:  
    status=Biking
```

# Example 2: Activity Recognition



```
if speed <=4:  
    status=Walking
```



```
if speed <=4:  
    status=Walking  
  
else:  
    status=Running
```



```
if speed <=4:  
    status=Walking  
  
elif speed<12:  
    status=Running  
  
else:  
    status=Biking
```



# Example 2: Activity Recognition



**Label: Walking**



**Label: Running**



**Label: Biking**



**Label: Lifting**

# Example 2: Activity Recognition



Label: Walking



Label: Running



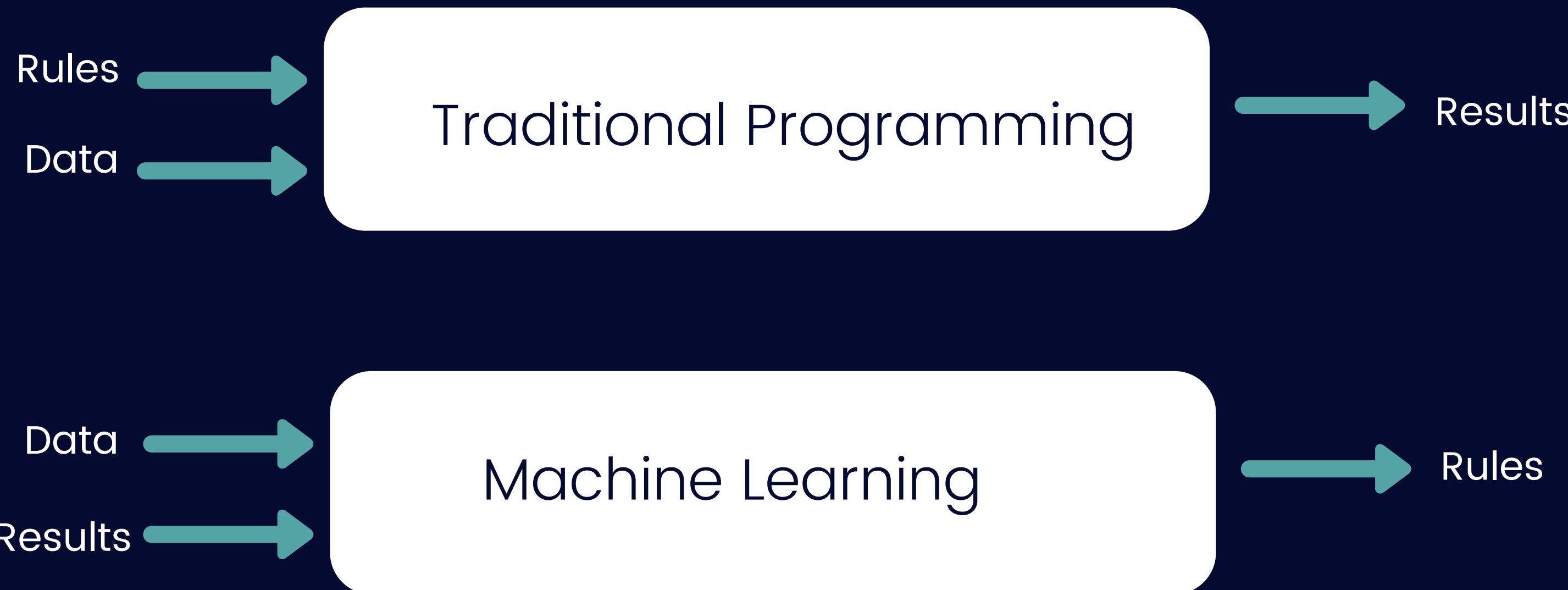
Label: Biking



Label: Lifting

Given images(data) of people doing all 4 activities(results or labels), machine learning can help us to find the rules or patterns between the data and the labels.

# Recall that



# Example Applications of Machine Learning

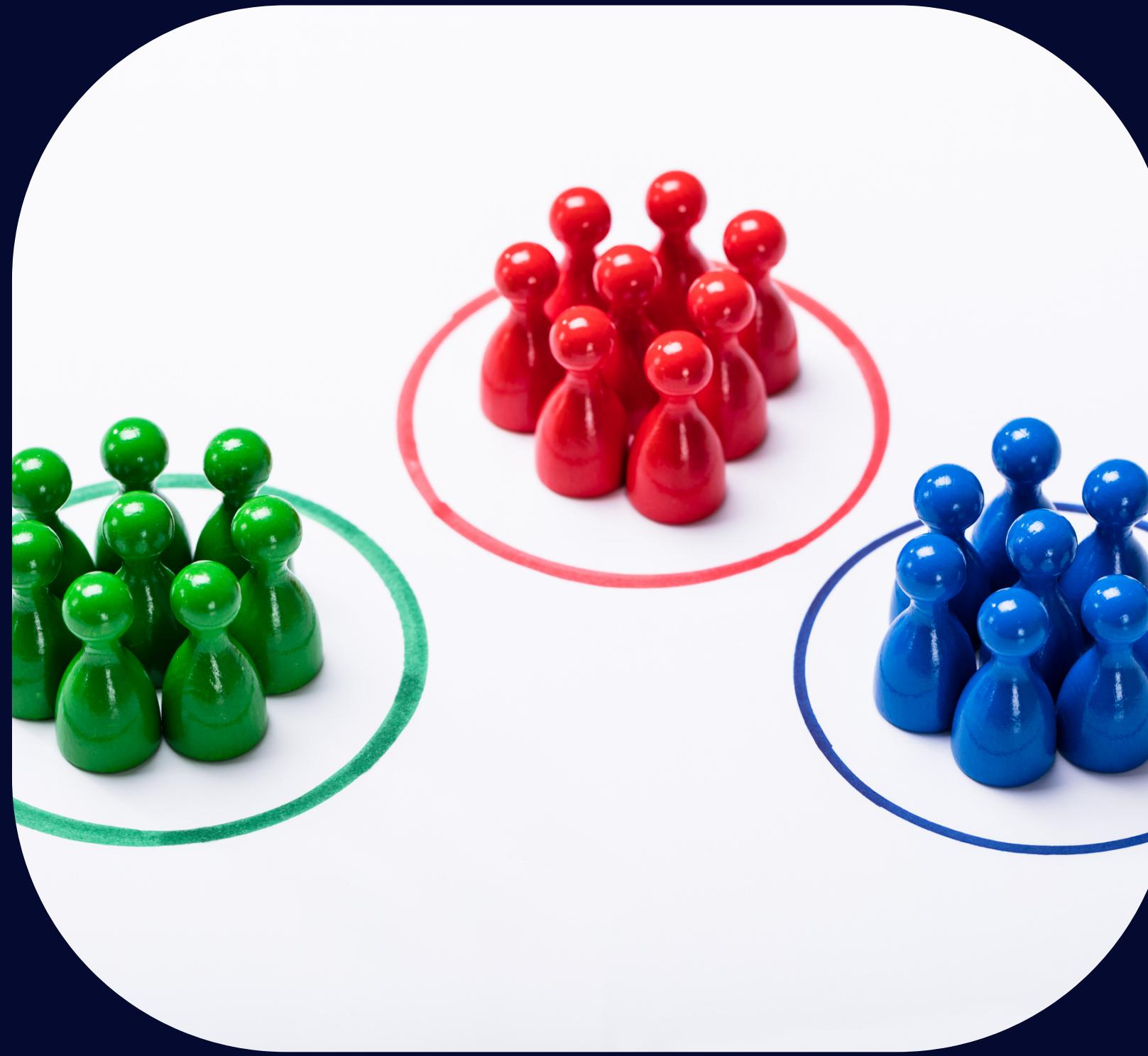
# Machine Learning In Finance



Loan Granting  
and  
Repayment  
prediction



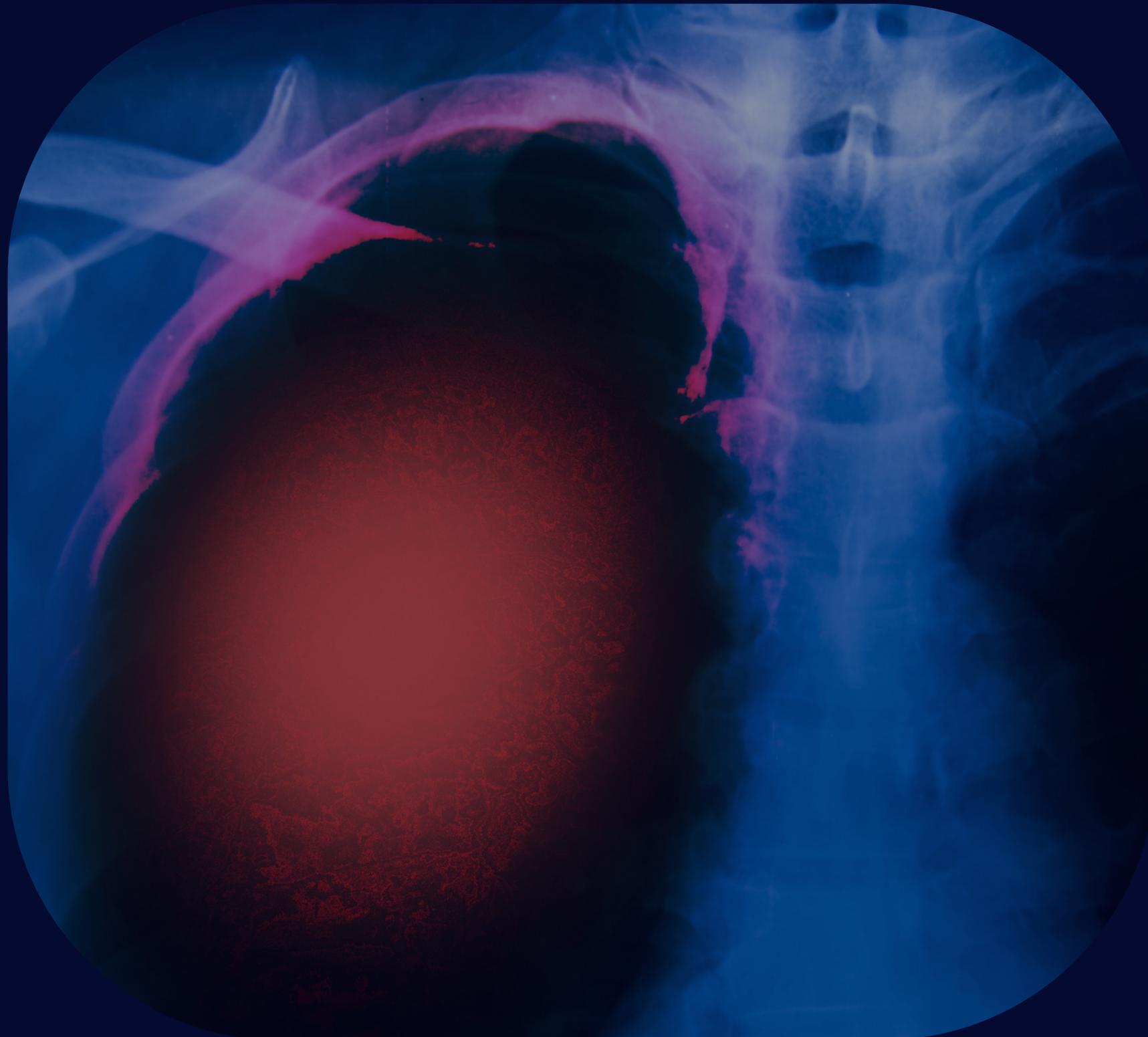
# Fraud Detection



# Customer segmentation

# Machine Learning In Medicine

# AI in Medicine



Diagnosing patients

Estimating the future of the patient's health

Estimate the right treatment relevant to patient's condition

# Machine Learning In Autonomous Vehicles

# Self driving cars



Pedestrian detection  
Traffic signs detection  
Detecting surrounding  
objects  
Lane projection

# Other ML Applications

Spam email detection

Sentiment Analysis

Detecting fake product reviews

Et....

# Careers In AI and Machine Learning

# A forenote about careers and tools

AI and ML careers are not mature yet like other types of computer science fields like software engineering.

The skills expectations and tools are different from person to person, and from company to company.

And you should be okay not knowing all tools.

# Data Analyst

# Data Analyst

## Skills

Business analysis

Building dashboards

Creating reports

A/B Testing

# Data Analyst

## Skills

Business analysis

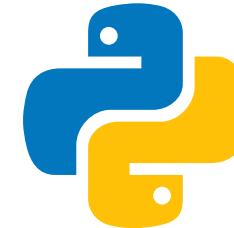
Building dashboards

Creating reports

A/B Testing

## Tools

Python



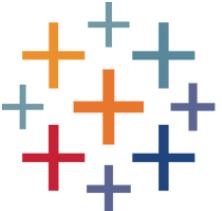
R



SQL



Tableau



PowerBI



Excel



Or

Or

Presentation tools



# Data Scientist

# Data Scientist

## Skills

Business analysis

Data engineering

Modelling

A/B Testing

# Data Scientist

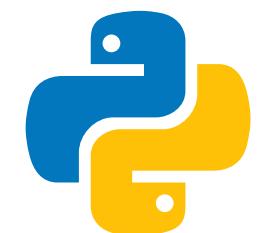
## Skills

Business analysis  
Data engineering  
Modelling  
A/B Testing



## Tools

Python



or

R



SQL



Tableau



PowerBI



Excel



Presentation tools



git

# Machine Learning Engineer

# Machine Learning Engineer

## Skills

Data Visualization

Data Engineering

Classical Machine Learning

Deep Learning

# Machine Learning Engineer

## Skills

Data Visualization

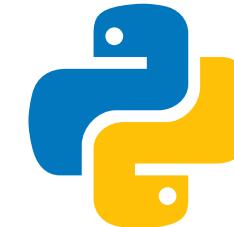
Data Engineering

Classical Machine Learning

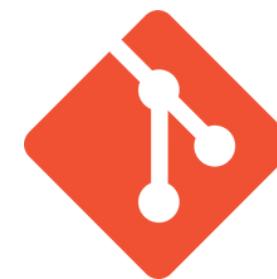
Deep Learning

## Tools

Python



SQL



git

Data visualization and preprocessing



matplotlib



seaborn



NumPy



pandas

Machine Learning



scikit  
learn



TensorFlow



Or PyTorch

# Deep Learning Engineer

# Deep Learning Engineer

## Skills

Data preparation

Classical Machine Learning

Deep Computer Vision

Deep Sequence Modelling

Or

# Deep Learning Engineer

## Skills

Data preparation

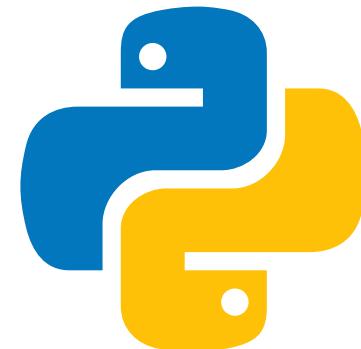
Classical Machine Learning

Deep Computer Vision

Deep Sequence Modelling

## Tools

Python



SQL



Git



Machine Learning



TensorFlow



Or PyTorch



# AI/ML Researcher

# AI/ML Researcher

## Skills

Building state of the art  
algorithms

Working on new problems

Classical ML + Deep  
Learning

Publishing papers

# AI/ML Researcher

## Skills

Building the state of the art algorithms

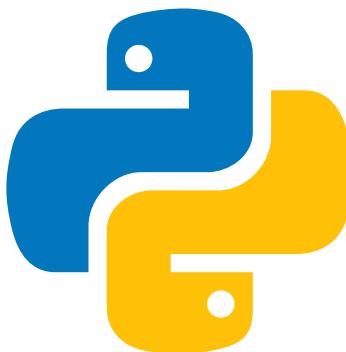
Working on new problems

Classical ML + Deep Learning

Publishing papers

## Tools

Python



SQL



Git



Machine Learning



TensorFlow

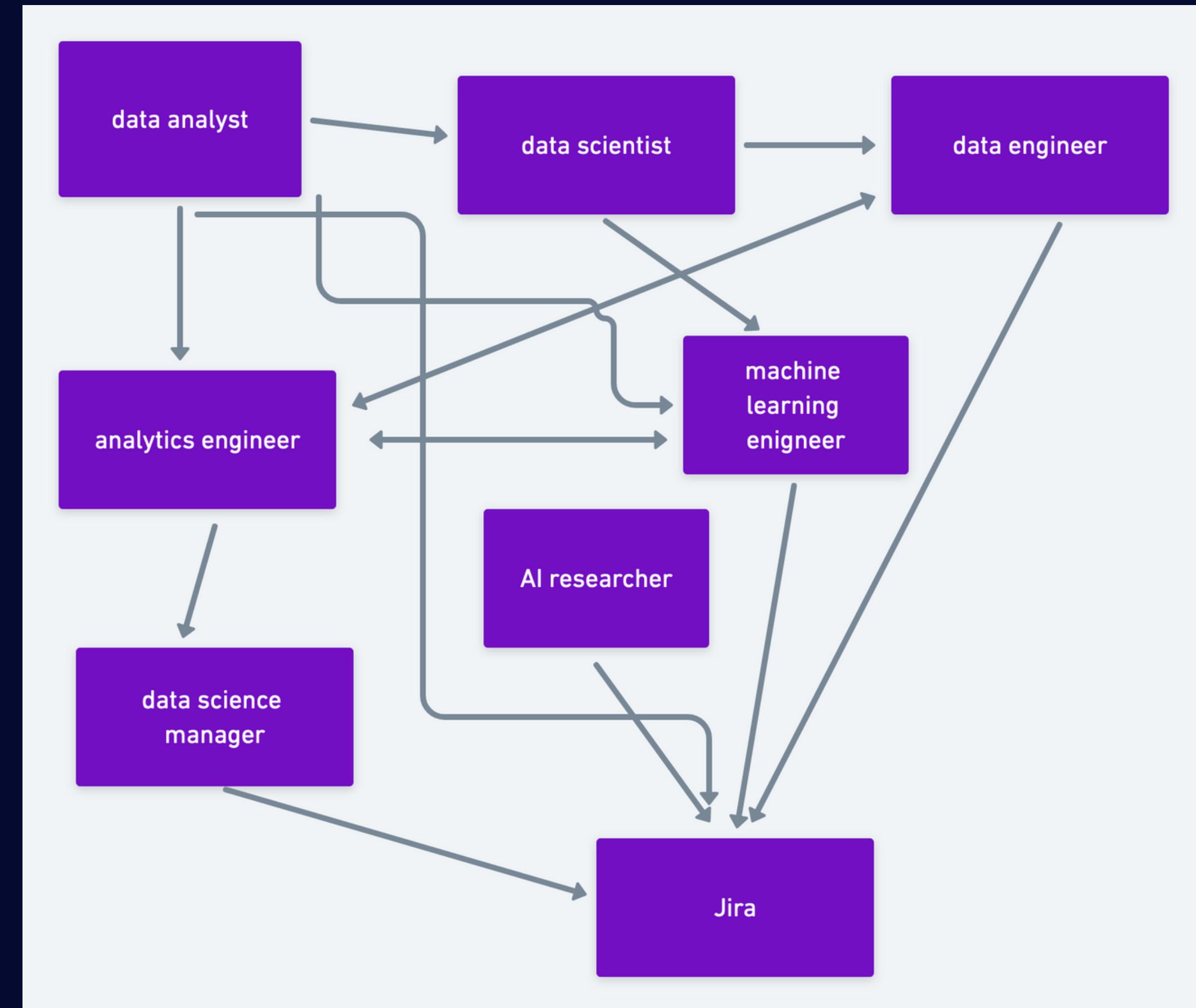


Or

PyTorch



# AI Careers



**Learning  
Practicing Skills  
Getting a Job**

# ML Learning Resources

Kaggle Intro  
courses



# ML Learning Resources

## Courses



Machine Learning Stanford

Deep Learning Specialization

TensorFlow Developer Program

Advanced TensorFlow Techniques

Machine Learning Engineering Operations

Kaggle Intro  
courses



# ML Learning Resources

## Courses



Machine Learning Stanford

Deep Learning Specialization

TensorFlow Developer Program

Advanced TensorFlow Techniques

Machine Learning Engineering Operations

Kaggle Intro  
courses



Test and assess yourself with  
Workera



# ML Learning Resources

## Courses



Machine Learning Stanford

Deep Learning Specialization

TensorFlow Developer Program

Advanced TensorFlow Techniques

Machine Learning Engineering Operations



Kaggle Intro  
courses



Test and assess yourself with  
Workera



Prepare for Interviews

Introduction to Machine Learning  
Interviews Book

<https://huyenchip.com/ml-interviews-book/>

# Practicing Skills

Join Kaggle and start working on competitions (for learning)

# Practicing Skills

Join Kaggle and start working on competitions (for learning)

Blog on Medium or Hashnode

# Practicing Skills

Join Kaggle and start working on competitions (for learning)

Blog on Medium or Hashnode

Share your works

# Practicing Skills

Join Kaggle and start working on competitions (for learning)

Blog on Medium or Hashnode

Share your works

Join a community and expand your network

# Practicing Skills

Join Kaggle and start working on competitions (for learning)

Blog on Medium or Hashnode

Share your works

Join a community and expand your network

Find a job that is right for you

# Happy Learning!

# Thank you!