INTRODUCTION TO MACHINE LEARNING

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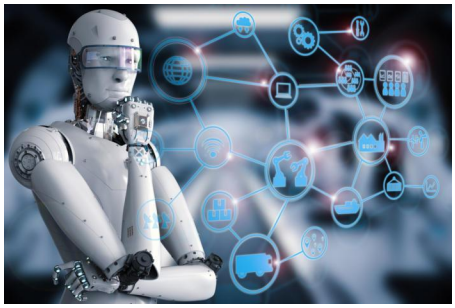
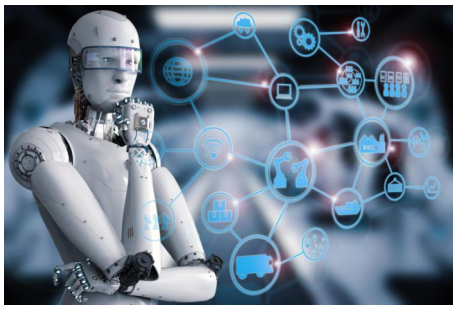
ABOUT THE AUTHOR



Noel Moses Mwadende is currently 2 year Computer Science and Information Security student at University of Dodoma , Data Scientist and well specialized in python for ethical hacking ,Penetration Tester, Malware Analiysist, Hacking tools writer already written “INFORMATION GATHERING TOOL” mostly used for penetration testing phases of Information Gathering and Reconnaisance, writer of different books about programming language, hacking, malware and Computer security in general also a member of Udom CyberSec lab, After making several experiments in Udom CyberSec lab , Noel started to write different books concern security with great passion starting with his book of "WIFI HACKING IN FEWS STEPS" ,"PANDAS TOOL FOR DATA SCIENTIST","HOW TO MAN IN THE MIDDLE ATTACK",”MAKING OUR ANDROID TROJAN-HORSE”,”MY WIN TROJAN-HORSE” and "WRITE VIRUS BY BATCH PROGRAMMING" and still different books are being written , and I will keep on releasing my different written books for you my reader , but don’t get tired.

ACKNOWELDGEMENT



First and foremost, thanks to my instructors of Data Science Sir Salim Diwani, Mr Eliah and Miss Martha Shaka,without you all i couldn't be good Data Scientist and I could not be able to write this book , I appreciate you so much , as I did my Data Science project during IPT and it was very enjoyable can't forget those moments.

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Thanks to you everyone , I hope without reader no book can exist in this world.

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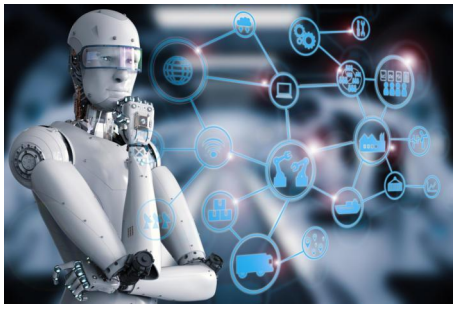
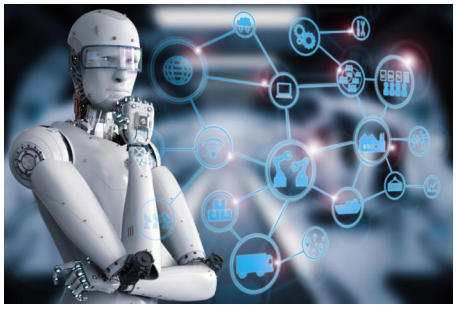
INTRODUCTION/OVERVIEW



INTRODUCTION TO MACHINE LEARNING



Machine Learning is the system that can learn from examples through self-improvement and without explicitly coded by programmer, the meaning come with idea that machine can learn from data or examples to produce accurate results. Machine learning is closely to data mining and Bayesian predictive modelling.

Arthur Samuel described machine learning as "it is the field of the study that gives the ability to the computer for self-learn without being explicitly programmed"

it is like program which can teach themselves and bring a certain output when exposed to new data.

machine learning is sub-field of AI (Artificial Intelligence).

COMMONLY MIXED TERMS IN MACHINE LEARNING

-Data science

is a multi-disciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from structured and unstructured data.

-Machine Learning

is the field of computer science that deals with giving ability to the computer to self-learn and do a work which may be prediction .

-Big Data

is the field that deals with the ways to analyse, systematically extract information from data set that are too large or complex to deal with by the traditional data processing application software. Data with many rows offer greater statistical power, while data with higher columns may lead to higher false discovery rate.

-Data Mining

is the process of discovering patterns in large data sets involving methods such as machine learning, statics and database systems.it is an interdisciplinary subfield of computer science and statics with an overall goal to extract information from data set and transform the information into a comprehensible structure for further use.

-Algorithms

are the methods or procedures taken inorder to get the task done or to solve a certain problem sometimes these algorithms are called classifiers.

-Models

are well defined computations formed as the result of an algorithm that takes some values as input and produces some value as output.

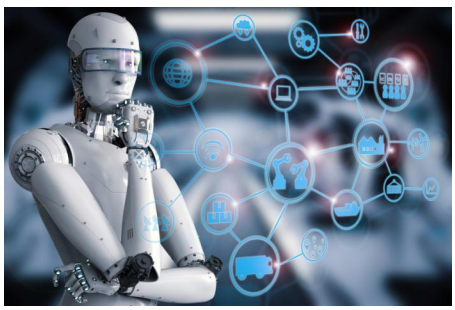
so model is the result of algorithm, they takes some values as input , process them and come with output.

RELATION BETWEEN DATA SCINCE AND MACHINE LEARNING.

Data science is broad term for multiple disciplines, machine Learning fits within data science, machine learning uses various techniques like regression and supervised clustering on the other hand data in data science may or may not evolve from machine.

Machine learning includes some techniques that can be useful for data scientist, but data science do not more rely on machine learning , but data science is much more broad or wide.

TYPES OF MACHINE LEARNING



1. Supervised

2. Unsupervised

3. Reinforcement

1. SUPERVISED MACHINE LEARNING

is the type of machine learning that learn from past input data and make future prediction as output.is the machine learning in which labelled data used to train the algorithms, algorithm are trained using data with labelled names where the data is divided into train and test same like input data and output data, these input data are called features, indicated by x and output data which is indicated by y.

TYPES OF SUPERVISED MACHINE LEARNIG

1. **= = => Classification (yes or no, High or low)**

This is concerned with building models that separate data into distinct classes, it always deals with problem which have binary output, that is two output.

Classification Algorithm

= Logistic Regression

= K-Nearest Neighbours

= Support Vector Machine

= Kernel Support Machine

= Naive Bayes

= Decision Tree

= Random Forest

2. = = => Regression

This is based on taking input data and then machine learning predict continuous output values, as you can see that the data differs between classification and regression learning, in classification the output is binary but in regression learning the output is continuous.

2. UNSUPERVISED MACHINE LEARNING

is the type of machine learning that try to find hidden structure pattern by using unlabelled data, the model is given data or examples then after understanding the new data are given to the model to test it.

TYPES OF UNSUPERVISED LEARNING

1. = = = > Clustering

This is used for analysing and grouping data which does not include pre-labelled class or even a class attribute at all.

Clustering Algorithm

= K-Means

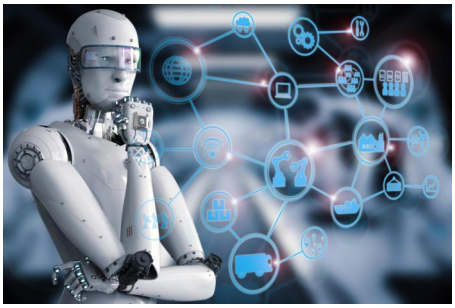
= Hierarchial clustering

= Hidden Market model

2. = = => Association

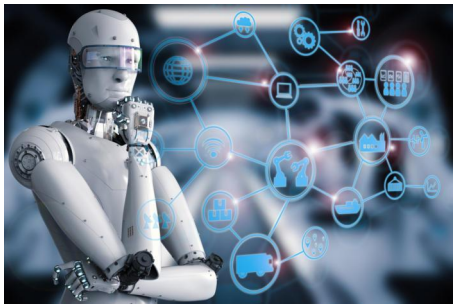
Discover the probability of co-occurrence

HOW DOES MACHINE LEARNING WORK



It is like the way machine learn is like human being, human learn from experience, as long as we know is when our ability to handle different situation grow, it is where we can predict different things in the society, for example an old man who has lived about 125 years , passed through many summer and winter season in his lifetime can easily predict when will the rain start for the next year due to his experiences, it is the same way machine learning works , given many data composes of many rows and columns about rain statics of the past year it will become easy for it to predict when or at what amount the rain will be.

APPLICATION OF MACHINE LEARNING & STAGES



1. Search engine result

2. Voice recognition

3. Face recognition

STAGES OF MACHINE LEARNING

1. Data Collection.

2. Data Preparation.

3. Choose a model.

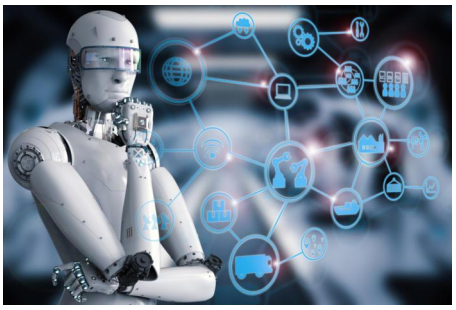
4. Train the model.

5. Evaluate the Model.

6. Parameter Turning.

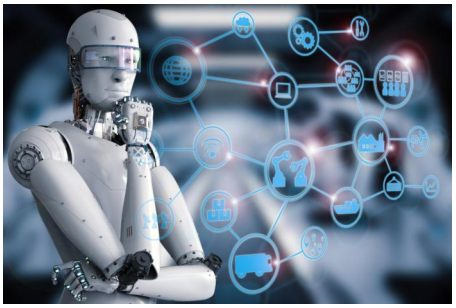
7. Make Predictions.

CONCLUSION



Thank you that was the end of machine learning, as it involved many concept, before starting working with algorithm, or doing machine learning project, the overview of machine learning is needed, and it is already provided above, so one doing project should get overview and know the through pass of ml project.

REFERENCES



-https://www.programcreek.com/python/example/3149/zipfile.BadZipfile

-https://www.datacamp.com/community/tutorials/zip-file

-https://realpython.com/python-exceptions/

-https://www.geeksforgeeks.org/python-string-strip-2/

-https://www.geeksforgeeks.org/time-functions-in-python-set-1-time-ctime-sleep/ -Kali Linux Cookbook - Second Edition