Informatics Institute of Technology

Trends in Computer Science

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Machine Learning

Overview of Machine Learning. How does it compare with conventional computing?

Wanninayaka Mudiyanselage Vinura Imesh
Uow Number :- 19857312
IIT Number :- 20222152

Group Members :-

Full Name	Uow Number
1.Vinura Imesh	19857312
2.Hirushi Fernando	19855516
3.Sudew Abhayapala	20015123
4.Dewmika Anusara	19857329
5.Manusha sachin	19995052

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2.INTRODUCTION

In this century all tech addicts consider Artificial Intelligence. We have heard Machine Learning is a part of artificial Intelligence. In the past we have heard world chess champion Gary Kasparov was defeated by computer program called Deep blue. To make programs like that we want Machine learning. In this report, I'm going to talk over Machine learning, Conventional/Traditional computing and what are the similarities, differences of these two things.

3.OVERVIEW OF MACHINE LEARNING

3.1.WHAT IS MEANT BY MACHINE LEARNING

Machine learning is the subfield of computer science that gives computers the ability to learn without being explicitly programmed. (Arthur Samuel, 1959)

Machine learning is a technique which concerned with the design and development of algorithms and techniques that allow computers to learn.

3.2.EVOLUTION OF MACHINE LEARNING

The fast progress in the area of machine learning has raised a question in every person's mind: can machines learn better than humans? To find the answer to that, the first step is to understand what is meant by learning from a human perspective. Then we can get a better understanding of machine learning. In the end, we need to know whether machine learning has surpassed or has the possibility of surpassing human learning in every facet of life.
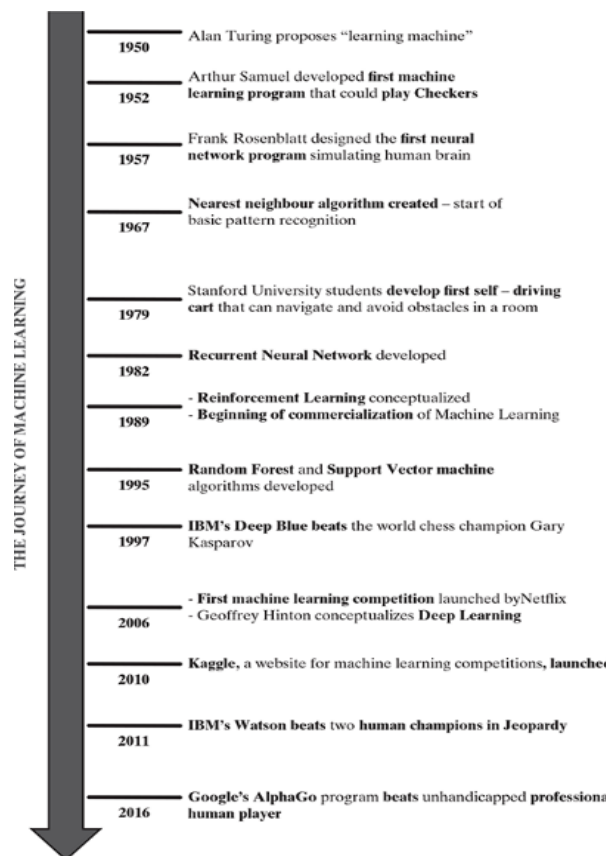

Figure3.2.1 journey of machine learning

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3.3. MACHINE LEARNING METHODS

3.3.1. SUPERVISED LEARNING

This machine learning assignment involves developing function that, using example input-affair pairs maps and input to an affair. It uses training data that adheres to a set of training samples to infer a function. The algorithms with external backing are known as supervised machine learning algorithms. Train and test datasets are created from the input datasets. The variables in the train dataset need to be arranged or predicted.
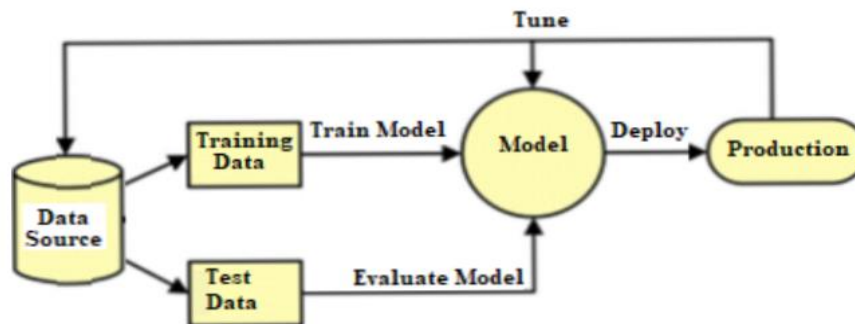

Figure3.3.1.1 Supervised learning work flow

3.3.2. UNSUPERVISED LEARNING

They are identified as "unsupervised learning" because, it's totally different from supervised learning what I described above, there are no right answers and no teachers. The algorithms are left to fend for themselves. To identify and present the data's intriguing structure. unsupervised learning algorithms are learned few traits from the data. As new data is introduced, it recognizes the class of the data using the previously learned features. It mostly utilizes for feature reduction and grouping.
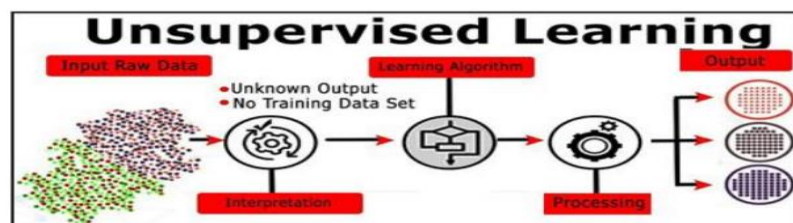

Figure3.3.2.1 Unsupervised learning

4.CONVENTIONAL COMPUTING

4.1. WHAT IS MEANT BY CONVENTIONAL COMPUTING

A computer is not smart; it performs tasks described in a program form, as orders of what to do and how to do it, and this is called traditional programming. (EL Kamel et al ,2020).

If we consider conventional computing, It's totally different from ML. It use conventional procedural language. In traditional computing, we must provide commands and logic to the computer via a program. The computer then requests inputs, which we provide, and it processes and outputs the results.

Figure4.1.1 conventional computing

4.2.DIFFERANTATION OF MACHINE LEARNING AND CONVENTIONAL PROGRAMMING

In conventional programming, set of data and set of instructions are fed to the computer. Then machine will fine the most efficient way to process the data and helps humans with giving quicker output. Then we consider about Machine learning we fed massive amount of data to the computer, after that it will process and create a best solution(Trained model). This structure will use to solve invisible problems in real world.

4.3. MACHINE LEARNING VS CONVENTIONAL COMPUTING

Machine learning	Conventional computing
✦ In machine learning, past experience are use for learn by machines.	✦ In conventional computing we have to feed data to machine.
✦ ML can learn using previous data, It choose suitable pattern after analyzed data.	✦ It can't earn from previous data.
✦ ML is automatic.	✦ It's not automatic.

Figure4.3.1 Machine Learning	*Figure4.3.2 conventional computing*
✚ On the contrary, in machine learning programming, the input and output data are fed to the algorithm which creates the program.	✚ In conventional computing data are feed manually to the computer, then it provide output depending on the programming logic.
✚ ML is more advance than conventional computing.	✚ It's not advance than ML.
✚ Use Linear algebra.	Use Boolean algebra.
✚ It's able to make own steps using input data and results.	✚ The steps and the logic fed to the computer by programmer then it will solve the problem.
✚ It can perform multiple tasks simultaneously.	✚ Conventional computers able to perform one task at a time.
✚ Need large space, To training based on past data it wants large inputs.	✚ Space is not important because it use small space to store programs.
✚ Significant time use to train, it depends quantity of data are we given.	✚ Data cannot be train, so no time needed to train.

5. CRITICAL EVALUATION

Machine learning uses in various fields. As in all technologies critical evaluation is important for machine learning.one of its strength is identify and make predictions using large amount of data. This can be specially useful in fields which has lots of data to filter, like medical researchers, financial analysis .another advantage of ML is it has ability to learn from new data. However the correctness of predictions is depend on quality of the data. It's a limitation of it. The data should not be biased. As a whole machine learning is a powerful tool, we should use it with knowing its strengths and limitations.

6.CONCLUSION

According to the above fats we can conclude Machine learning is automatic system which use previous data to learn and gives fruitful output for our problem. It mainly divide into two parts as supervised and unsupervised learning. In Supervised learning it use labeled datasets to train algorithms for organize data or predict outcome correctly. In unsupervised learning it's able to analyze and group unlabeled datasets

with applying machine learning. Without human intervention it discover hidden patterns or data groupings. Then the conventional computing human intervention is compulsory. It gives outputs for input data through the programs which humans are fed to computers. Ultimately, both of these methods are important to accomplish a variety of tasks.

Word count = 977

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