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REVOLUTION IN ALGORITHM AND MASTERY IN MACHINE LEARNING

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Abstract

An algorithm is a sequence of instructions telling a computer what to do. An algorithm is not just any set of instructions: they have to be precise and unambiguous enough to be executed by a computer. If computers make us smarter, computers running the Master Algorithm will make us feel like geniuses. Today, algorithms are in every nook and cranny of the human imagining. As homo sapiens adapts the world to itself, rather than adapting to the world, the Master Algorithm in Machine Learning (ML) is the newest chapter in this million-year-old self-taught saga that will make unimaginable progress for the benefit of this world. It is in this digital space that is advancing more and more day by day, thanks to Artificial Intelligence (AI) and (ML), man is experiencing what he wants. He is changing accordingly, without losing security and without feeling any panic. Today, Machine Learning is not just a futuristic fantasy, it's already here. In fact, it has been around for many years in some applications. Machine Learning is the science and art of programming computers so they can auto-learn from this data. By combining many such operations, through machine learning, we can create a chain of logical reasoning. But (ML) algorithms, also known as learners, are different: they figure it out on their own, by making inferences from data. And the more data they have, the better they get. Now we do not have to program computers., they program themselves. If it exists, the Master Algorithm can derive all knowledge in the world past, present, and future from data. Inventing it would be one of the greatest advances in the history of science. It would speed up the progress of knowledge across the board and change the world in ways that we can barely begin to imagine.

Keywords: Algorithm, Machine Learning, Artificial intelligence, digital

INTRODUCTION

We all believe that the Pythagorean theorem expressed by the equation $(a^2 + b^2) = c^2$ which is quite simple in importance is extraordinary. This postulates that union is the law of God, development is the law of life, number is the law of the world, in which we are living it every day. In any field of science, if a theory cannot be expressed in the form of an algorithm, it will remain completely unclear. And this assertion is as important and true as the postulate of the famous sophist. Designing an algorithm is not easy. The dilemmas and problems you have to anticipate are numerous and nothing can be taken for granted. Some of the intuitions will turn out wrong and you will have to find another way. "Computers are useless," Picasso said. "The computer does not have to be creative, it has to do what you tell it to do." But if what you tell them to do is creative and works automatically, we have discovered an apocalyptic world. In this world where the advancement of technology and artificial intelligence are the key words, we have a gift from the algorithm. Once it is created correctly as a block diagram, an algorithm to be applied, it must be written in a language (C ++, Java, etc.) so that computers can understand and obey and act according to its commands. Through the algorithm we have to find every error and correct it until the computer program works without bothering us. The programmer is definitely the key to this digital paradise, he creates the algorithms and codifies them, creating the universe as desired. Algorithms today are being combined with other algorithms to use the results of other algorithms, and producing results for even more other algorithms, we will move on to its highest degree, the Master Algorithm. When you do not know what you are looking for, the wind that blows are not that it helps you much, this is one of the expressions of the philosopher Seneca. No one has programmed book preferences into Amazon's referral system, but it is a machine learning algorithm that has provided them on its own, generating from past purchases and companies are getting to know their customers like never before. A machine equipped with a machine learning algorithm, takes machine learning by observing what the driver does.

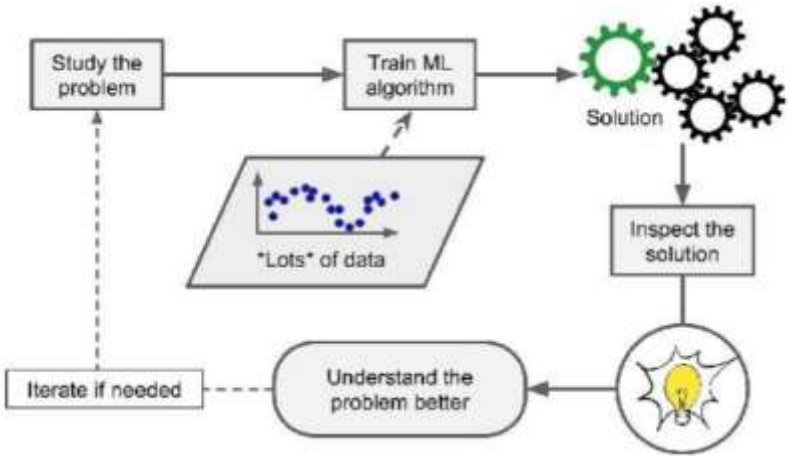
LITERATURE REVIEW

What is an Algorithm in Machine Learning?

An (ML) algorithm is a data-driven procedure to create an machine learning model. ML algorithms perform "pattern recognition". Algorithms learn from data, or are convenient in a database. There are many machine learning algorithms. For example, we have regression algorithms, such as linear regression, and we have aggregation algorithms, such as k-tools. The types of ML Algorithms are: Linear Regression, Logistic Regression, Decision Tree, Artificial Neural Network, k-Nearest Neighbors-Means.

You can think of a machine learning algorithm like any other algorithm in computer science. Machine learning algorithms have a number of features: ML algorithms can be described using mathematics and pseudocode. The effectiveness of machine learning algorithms can be analyzed and described. They can be implemented in any range of modern programming languages. For example, we can distinguish ML algorithms described by pseudocode or linear algebra. You can see the computational efficiency of a specific machine learning algorithm compared to another specific algorithm.

Figure 1. Machine Learning can help humans learn



Source: A.Géron., 2017, “Hands-On Machine Learning with Scikit-Learnand TensorFlow”

What is a "model" in machine learning?

A "model" in ML is the output of a data-driven ML algorithm. The model represents what has been learned from an machine learning algorithm. The model is the "think" that is stored after the execution of an algorithm in machine learning. To make predictions through the algorithm the data must present the rules, numbers, and everything else specific to the algorithms from the data structure. Some examples to be clearer on the concept of model in machine learning: The linear regression algorithm is a model consisting of a vector of coefficients with specific values. The decision tree algorithm results in a model consisting of a tree with specific values. An machine learning model is more challenging for a beginner because there is no clear analogy with other algorithms in computer science. Beware, ranking the list of results in the ranking of an algorithm is not a model. The best analogy is to think of the machine learning model as a program. The machine learning program model consists of both data and a procedure for using the data to make a prediction. For example, consider the linear regression algorithm and the resulting model. The model consists of a vector of coefficients (data) that are multiplied and summarized with a row of new data taken as input in order to

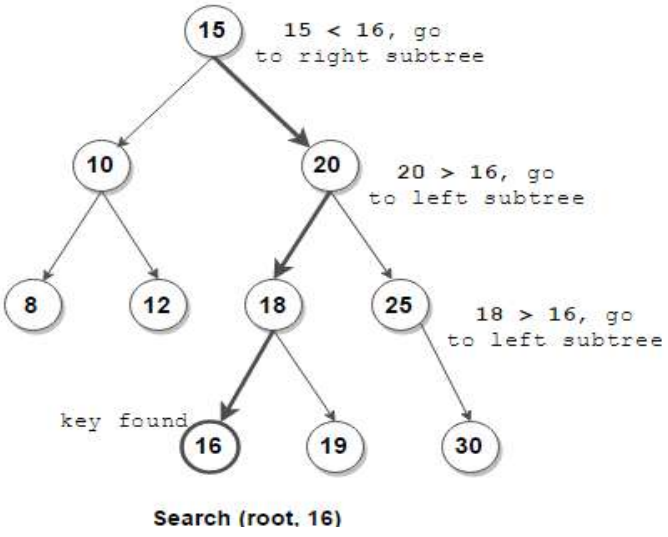
make a prediction (prediction procedure). ML algorithms to be created must first of all understand each part in order to understand the whole. They carry endless difficulties until you can implement them from scratch, step by step. Math can really slow you down, and demotivate you. The problem is that machine learning algorithms are not like other algorithms you may have implemented as classification. They are always described using complex mathematics with a mixture of probability, statistics and linear algebra. Under these conditions mathematics really creates great difficulties. In constructing them we must be able to pass mathematical descriptions in order to apply the algorithms from scratch. This means that a lot of time is required. So much so that we study math within 1 year to get where we want. Then you really need clear working examples, step by step with real numbers. ML algorithms would be much easier to understand if one simplified the math and gave clear working examples demonstrating and orienting how real numbers are entered into equations and which numbers we should expect as results. With clear inputs and outputs, the algorithm developers reproduce and understand the math. data, and all calculations required to make predictions from the learned model. Master Algorithms in ML are for developers only.

RESEARCH METHODOLOGY

D. Michie, The Turing Institute, George House, 36 North Hanover Street, Glasgow Gl 2AD, in the paper entitled: Methodologies from Machine Learning in Data Analysis and Software, orients us correctly for the logical function in designing and interpreting an algorithm and then in machine learning.

Applicability has been shown both to data derived from databases (real case histories) and from simulators (model case histories), as in the following knowledge-intensive application areas.

Figure 2. Search (root, 16)



Source : www.techiedelight.com/search-given-key-in-bst/

Synthesis from simulation data

- aerospace
- instrumentation
- manufacturing
- generating software from specifications
- Synthesis from captured data
- circuit fault diagnosis
- clinical diagnosis
- credit control
- stockmarket assessment

In what follows the essentials of rule-based techniques drawn from machine learning are summarised in the context of earlier approaches. To illustrate the way in which iterative situation-action problems can be coded as classification, consider the task of solving simple equations in schoolroom algebra. Thus (3x+3) =15 if x≥ 4 is transformed by an appropriate action into (3x+3) =15 if x≤4 , which is in turn transformed into 3x = 12 (by 'combine like terms') and thence into the final 'situation', x = f (by 'divide by the coefficient of the unknown'). This is the solution or 'goal'. Using the attributes/classes format, the problem description is given in Figure 2,

Line 1 gives the results for those x x≥ 4, while line 2 for those x≤4. Just walk to this function and the algorithm is infallible. The key to the six attribute names is:

(al) Does the equation have a common factor?

(a2) Are there like terms on opposite sides? (likeopp)

(a3) Are there any bracketed terms? (bracket)

(a4) Does either side have like terms? (likesam)

(a5) Is exactly the same present on both sides?

(a6) Is there only one unknown term and is its coefficient equal to one? (xcoeffl)

The seven class names given earlier have the following interpretations:

(1) Divide the equation by its common factor (divcf).

(2) Collect like terms on the same side of the equation (collect).

(3) Multiply out bracketed terms (multbr).

(4) Combine like terms (combine).

(5) Cancel out a term that appears on both sides (cancel).

(6) Divide by the coefficient of the unknown (divcx).

(7) Stop because the equation is solved (stop).

The four lines of examples given at the outset, namely 3x+3=15, = 3x = 15-3 , 3x=12 , x=4

A more demanding definition of learning is now coming from applied artificial intelligence: a learning system uses sample data to generate an up-dated basis for improved classification of subsequent data from the same source, and expresses the new basis in intelligible symbolic form. According to this more demanding definition, not only improved performance results from the learning process, but also an explicit set of rules.

Decision-tree induction in the algebra domain meets not only the less demanding but also the more demanding criterion.

if exactly the same term occurs on both sides
then cancel the same term from each side
else if the equation has a common factor
then divide by the common factor
else if there is a bracketed term
then multiply out the brackets
else if there are like terms on opposite sides
then collect like terms on the same side
else if one side has more than one like term
then combine like terms
else if the unknown term has a coefficient not equal to one
then divide by the coefficient of the unknown
else stop; the equation is solved.

A brief summary of what ML includes can be found in (Dutton and Conroy, 1996) De Mantaras and Armengol (1998) also presented a historical study of logic and example-based learning classes. There are several Machine Learning (ML) applications, the most significant of which is predictive data mining. All data used by a Machine Learning algorithm is represented using the same feature set. Features can be continuous, categorical or binary.

Jason Brownlee Melbourne, Australia 2016, on the preface of the book: Master Machine Learning Algorithms, Discover how they work and implement them from scratch, Machine Learning Mastery, gives us an orientation: You can describe machine learning algorithms using statistics, probability and linear algebra.

The best way to describe a machine learning algorithm for us is:

1. In terms of the representation used by the algorithm (the actual numbers stored in a file).
2. In terms of the abstract repeatable procedures used by the algorithm to learn a model from data and later to make predictions with the model.

3.With clear worked examples showing exactly how real numbers plug into the equations and what numbers to expect as output.

Machine learning is an interactive technology that builds itself within the virtual world. But does this virtual world work? If the question for the two additional flights would be: Want to add two numbers? Computer interpretation then sets in motion a combination of former transistors now called closed silicon circuits that enable this. It would be extremely expensive if we had to constantly build from a different computer model for each different function we want to perform. Every second, billions of transistors in billions of computers pass billions of times. The algorithms within them form a new kind of ecosystem, ever-increasing, comparable in wealth only to life itself. So we need a computer model which is a wide assembly of those former transistors that can process many operations simultaneously through the vibration of the CPU in the motherboard channels, under sunlight. Michelangelo, all he did was create the statue inside the marble slab and carve the excess stone until the statue was unveiled. Likewise, the algorithm digs up excess transistors on the computer until the target function is detected, regardless of whether the output target is an autopilot of an aircraft or a new movie on Digitalb.

But how is it really, does it feature an algorithm?

An algorithm is much more than a set of instructions that must be precise and clear enough to run from a computer.

The computer needs to know how to execute the algorithm until the specific transistor returns to 1 and 0. Algorithms are always an accurate standard. Algorithm is also defined by a proverb" when you do not understand something again it will be understood until you can express it as an algorithm.

Richard Feynman said, "What I cannot create, I do not understand."

Scientists make theories, create algorithms, and manufacturers produce devices.

Data produces algorithms, which are two things at once: theory and equipment.

It is a fact that just as in life we encounter complexes, so we encounter the complexities of algorithms. Three are the most dangerous.

- Of Space;

The complexity of the space conditions an algorithm. It needs space to store in the computer memory. If the algorithm needs more memory space than the computer can provide, then it becomes useless and should not be considered.

- Of the time;

The complexity of time conditions the same. How long it takes for the algorithm to execute. In other words, how many steps of using and reusing transistors must be passed before producing the desired results. If this time is longer than we can expect, the algorithm is again useless and should not be considered.

- Human;

The most terrifying complexity is human complexity. When algorithms become too complicated for our weak brains, when interactions between different parts of the algorithm become more and more involved, errors linger and we cannot solve them. I say them, for them, because even the algorithm does not do what we want. If it automatically makes it work, it ends up being unnecessarily complicated for the people who use it and does not blend well with other algorithms, saving trouble for later.

Every computer scientist battles these three complexes almost every day. When computer scientists lose the battle, complexity seeps into our lives. You may have noticed that many battles are lost. But what motivates us is the fact that so far the war we still have lost. However, we continue to build our tower of algorithms, with great difficulty. Each new generation of algorithms must be on top of the previous ones and have to deal with their complexity in addition to themselves. A tower grows taller and taller and one day probably covers the whole world, but it is also more and more fragile, like a house waiting to collapse. A small mistake in an algorithm and a billion-dollar rocket explodes and does a lot of damage. The algorithms interact in unexpected ways and the stock market crashes and the most expensive futuristic cryptocurrency turns into a five lek. If programmers are little gods, the monster of complexity is the devil himself, so P. Domingos would say. And the complexity has taken a lot of ground, he seems like little by little, he is winning the war. Definitely here should be a better way for the opposite to happen. These seemingly magical technologies work because at their core lies hope, Machine Learning. She definitely has a prediction of her own. Predicting what we want to achieve from results and actions and not only that, but how to achieve and our goals that implies how the world will change. Once upon a time we relied.

FINDINGS

Since the time when our ancestors invented the wheel, humans have created moving objects, whether hand-built or mass-produced. In complete deduction everything that rotates has somewhere a wheel with a round or spherical shape, where sometimes we imagine it with teeth as a gear, sometimes as a mechanism and in not a few times we imagine it in front of a lever that slides it, like that lever of the genius who created the magic constant π, Archimedes. And machine learning algorithms are objects that set other objects in motion. A master

algorithm learning within it's rotating spirals of machine learning is producing every day an "intelligent" reality for the needs of the individual. Just as stonecutters turn diamonds into jewelry, so do programmers when it comes to data, which turns them into algorithms. And the more data they have, the more accurate the algorithms can be.

Today unmanned vehicles pilot themselves through land, sea and air. And because we know that sea and air land have many unknown black holes, we entrust the life of this pilot. Google self-driving car taught itself how to stay on the road, no engineer wrote an algorithm instructing it step by step, how to go from A to B. No one knows how to program machine parking in a car. How many times has it impressed us that something has changed in google translate ?! Translations are improving day by day in the conversion we do from one language to another ... it has even gone so far as to turn the sentence from oblique to straightforward. It is certain that no one has reprogrammed this application online but here it has been improved and is continuing to improve amazingly. But this improvement that is happening how is it happening? We may not notice it, but machine learning is all around us. When you search with a question on a search engine, this is how the engine provides the results to be served to us, and even for "scrap" gives you some ads that are also interesting to see. When we check email, we do not notice most of the spam because a secret hand filtered it. Go to Wish.com to buy a product or Net fl ix to watch a video. There is also a system that recommends good help for alternative products and movies of the same categories. Facebook uses direct communication to decide and orient us what are the essential updates which are activated automatically and on its whatsapp mobile network. Twitter does the same for tweets. Whenever you use a laptop nowadays, the chances are 100% that after restarting it will start where we left it when its battery dropped to zero and its shutdown occurred unintentionally and immediately off. And just as we are taught that everything has a reason why it happens, and in these cases we mentioned above, reason is as valuable as that formula of Pythagoras or that of π of Archimedes, and perhaps not so much for the function real virtual world. This reason is christened Machine Learning (ML). All of this is accomplished through machine learning (ML). The only way for a computer to accomplish something important when we are asked to add two extra numbers of an airplane flight has traditionally been to first write down with precision the algorithm that explains every detail about the flight. as well as what itinerary should be considered. And over time, if other variables related to these flights are to be added, from the habit and storage of discarded data from time to time, the next innovation will be self-created thanks to ML. Algorithms Machine Learning, also known as "learners", are different. They, drawing conclusions from the data, understand what they themselves have to do in the next step. And the more data they have, the better they know how to deal with the problem. But, in

order to deal with the problem, you must have not only ambition to solve it, but also enough knowledge and imagination to make it as creative as possible. Today we do not have to program computers, they program themselves. This is not just happening in cyberspace. It is a fact that this is most experienced in today's business, where budgets tend to be future-focused on data-driven marketing.

CONCLUSIONS

How can we prove that we have hope not only not to lose the war we are talking about but also to win it ?! There is only one answer. Creating the master of algorithms, Master Algorithm. He is the only one who can extract all the knowledge about the future by analyzing the present and the world beyond through the appreciation given to the past. The creation of the Master Algorithm is one of the greatest advances in the history of science. This will accelerate the progress of knowledge and change the world in ways we now barely begin to imagine. The Master algorithm is to learn what is the standard model for particle physics or molecular biology. A unified theory that makes sense of every function to date, and lays the foundation for decades or centuries of future progress. The Master Algorithm in Machine Learning is our gateway to solving some of the most difficult problems we face, from building home robots to curing incurable diseases today. Unfortunately, we are talking about Master Algorithm because while today’s machine learning algorithms can diagnose many diseases with superhuman accuracy, the cure for many incurable diseases is beyond their level. And just as programming itself was created there will definitely be a revolution and the path of hope will be created which is the Master Algorithm in Machine Learning which will be trumpeted like a eureka.

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