**Blog explaining your granny about machine learning**

You all should be loving your grandparents. They are always there to give you advice, have answers to almost every question, are always giving you a exciting and adventure moment, and love their grandchildren very much. Grandparents are very much cool except when you’re trying to show them how FaceTime on an iPhone works. Grandparents are not as familiar with this technology and thus explaining them is somewhat difficult.

For example, my granny calls Google chrome as the doodle chore and I’m not correcting her. So how we can explain machine learning in a way that a granny who does not have a experience in deep root can understand? In order to do that, I won’t get too technical to the language, but I will get in-depth into the topic and explain it in simple terms. I would cover the most important parts of machine learning ,the big part everyone should know. To make sure I don’t get too technical, I’ll be referring to all of you who are not too much familiar with ML, the reader, as grandma from time to time. It’s a way to remind myself that I need to explain this as simply as possible and not get ahead of myself.

So, Granny, **what is machine learning**? Machine learning is a field of study that gives computers the ability to learn without being explicitly programmed. It is a very exciting and growing field that’s making computers more similar to humans brains. It is different from traditional computer science approaches. In regular computing, instructions are given to the computer to calculate and solve. Computers are really dumb and have to be told exactly what to do and how to do it. With machine learning, though, we can give a computer lots of data to analyze. It can then train on that data to produce output values that fall within a specific range.

For example, you know how you post pictures on Instagram, and it recommends people you should tag because they too might be in the photo, and how about when you’re watching Netflix and it recommends shows or movies you might like? That’s a little taste of machine learning. When cars drive themselves, machine learning will play an important role. Cars will collect lots of data to learn how to drive better and safer. Hopefully, this is making a lot of sense because we haven’t got into the best parts of machine learning. One thing is for sure, that it is playing a great role in each time.

**What we know about ML?**

Machine learning is not about robots coming out to destroy humans like you see in the movies. “Terminator” is the first thing people think of when they hear the term artificial intelligence or AI. That’s another thing. Machine learning is not artificial intelligence, but a subset of AI. This field has been around for quite some time, with the roots going back to the late 1950s. During that time period, IBM’s Arthur L. Samuel created the first machine learning application, which played chess. Another buzzword you’ve probably heard is deep learning. Deep learning has been around just as long as machine learning, but it wasn’t until the 1980s that the field gained traction. Eventually, big companies like Facebook, Google, and Microsoft started investing heavily in the technology. The result has been a revolution for AI. Things like Google Translate ,Amazon Alexa and Apple’s Siri are examples of the power of this technology.I won’t get into what AI or deep learning is as machine learning is already a big subject to cover by itself. Just know there is no threat with machine learning — maybe with AI, though, if it gets out of hand.

**How we could get machine learn**

So you all might be thinking, how exactly do we get these machines to learn? How does a computer collect all this data and make sense of it? Well, I can tell you that there’s a lot of math and algorithms involved to help produce the desired results. So , Granny , I’m gonna break it down a simple as I can for you. But at the same time, I’ll explain in detail what’s under the hood of a learning machine.

**The maths hidden in the machine learning**

Math was never my favorite subject, but we’ve all come across linear algebra. Linear algebra is a field of mathematics that is universally agreed to be a deeper understanding of machine learning. Linear algebra is a large field with many complicated theories and findings. But the field’s basic tools and notations are helpful for machine learning any practitioners. With a solid foundation of what linear algebra is, it is possible to focus on just the relevant parts.

Math is important in this field because you need to know which algorithms to include when considering better accuracy, training time, and a lots of other stuff. The math helps us find a way to help the machine learn in the all best way possible. Other than linear algebra, a professional person will also need to know the mathematical concepts of Calculus, algorithms, probability theory, and statistics. Python is the most used programming language in this field as well. A beginner doesn't actually need a whole lot of math to get started in this field.

**How does it act like brain**

The world has a tons of information, and our brain takes it all in to form our view of reality. A computer has to be able to do the same, and that’s where a neural network comes into play. **Neural networks** are the most popular way to get a computer to act as a human brain. Your brain is made up of approximately billion nerve cells, which are called neurons. Our brains are really good at solving problems, and each neuron is responsible for solving a tiny part of that big problem. They have this good ability to collect all data and send the signals. Think of it like a network with a bunch of wires. So computers’ neural networks are inspired by the brain. Now, you may be wondering how the neurons are linked together. A neuron takes in inputs and produces outputs. The input nodes provide information from the outside world to the network. Similar to how your eyes see and collect information and send it to the brain.

The output nodes are the ones responsible for communicating that information back to the outside world. So a number in the input layer will go through the hidden layer. Then, it will come out the output layer as the number being recognized. The neurons in the hidden layer are going to communicate the information they got from each other. They’ll use this information to piece together what number they think is being passed along. Each layer influences the next. Things get even cooler when you’re training the computer to network for other things, like audio recognition. The computer can learn how to parse speech, break down audio, and pick out distinct sounds. These sounds are combined to make certain syllables, words, phrases, and etc.

There are other ways for a machine to learn, including supervised learning, unsupervised learning, and reinforcement learning. I won’t be covering those topics, but those are the three methods that are often employed. To put it simply, Grandma, a neural network lets the computer take information, break it down into pieces it can understand, and then outputs the closest outcome it can.

**Challenges and limitations**

As awesome as machine learning is, there are limitations to it. I’ll talk about the biggest ones I think need to be overcome for this technology to move forward. So machine learning algorithms require massive stores of training data. You need to make sure that the data being fed into the machine is labeled. If not, it’s not going to get smart over time. An algorithm can only develop the ability to make decisions and behave in a way that is consistent with the environment it’s required to navigate. Lastly, and most importantly, is avoiding bias. Transparency is important and unbiased decision-making builds trust. For example, facial recognition plays a large part in social media and law enforcement. If bias finds their way into an algorithm and data sets and the training data is not neutral, the outcomes will amplify the discrimination and bias that lies in those data sets.

**Machines are our future**

The future of machine learning is great and vast, and it’s the fundamental building block for artificial intelligence. Today, it already plays a role in our lives. If you use Spotify to listen to music, you will see it creates daily mixes for you based on what you’re listening to. Amazon learns and teaches itself how to get products that might be of interest to you based on your buying habits. Virtual assistance like Amazon Alexa, Apple Siri, or Microsoft Cortona use machine learning to help understand the language humans use when they interact with them and many more.

Many companies use chatbots and service bots in their customer service departments. These bots are learning to respond in an intelligent and helpful way to customers. The more data they collect, the more human-like they start to act. For example, they’ll know a stop sign covered with snow is still a stop sign. So there you have it, Granny, but hopefully, you have a better understanding of what machine learning is. I see machine learning as a tool that can continue to make our lives easier. People are continuing to come up with helpful ways to use machine learning, and they’re disrupting industries by doing so. I can only imagine where we will be our future when this technology leads to real AI and help to grow these industries.