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A simple way to understand machine learning vs deep learning

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differences.

And those differences should be known! Examples of machine learning and deep learning are everywhere. It's how Netflix knows which show you'll want to watch next or how Facebook knows whose face is in a photo. And it's how a customer service representative will know if you'll be satisfied with their support before you even take a customer satisfaction (CSAT) survey.

So what are these concepts that dominate the conversations about artificial intelligence and how exactly are they different?

What is machine learning?

Here's a basic definition of machine learning:

"Algorithms that parse data, learn from that data, and then apply what they've learned to make informed decisions"

An easy example of a machine learning algorithm is an on-demand music streaming service. For the service to make a decision about which new songs or artists to recommend to a listener, machine learning algorithms associate the listener's preferences with other listeners who have similar musical taste.

Machine learning fuels all sorts of automated tasks and spans across multiple industries, from data security firms hunting down malware to finance professionals looking out for favorable trades. They're designed to work like virtual personal assistants, and they work quite well.

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data given to it, and gets progressively better at that function. It's like if you had a flashlight that turned on whenever you said *"it's dark"*, so it would recognize different phrases containing the word *"dark"*.

Now, the way machines can learn new tricks gets *really* interesting (and exciting) when we start talking about deep learning.

Deep learning vs machine learning

In practical terms, deep learning is just a subset of machine learning. It technically *is* machine learning and functions in a similar way (hence why the terms are sometimes loosely interchanged), but its capabilities are different.

Basic machine learning models do become progressively better at whatever their function is, but they still some guidance. If an ML algorithm returns an inaccurate prediction, then an engineer needs to step in and make adjustments. But with a deep learning model, the algorithms can determine on their own if a prediction is accurate or not.

Let's go back to the flashlight example: it could be programmed to turn on when it recognizes the audible cue of someone saying the word *"dark"*. Eventually, it could pick up any phrase containing that word. Now if the flashlight had a deep learning model, it could maybe figure out that it should turn on with the cues *"I can't see"* or *"the light switch won't work"*. A deep learning model is able to learn through its own method of computing — its own "brain", if you will.

How does deep learning work?

A deep learning model is designed to continually analyze data with a logic structure similar to how a human would draw conclusions. To achieve this, deep learning uses a

ms called an **artificial neural network (ANN)**. The design of an

gical neural network of the human brain. This makes for

far more capable than that of standard machine learning

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A great example of deep learning is Google's AlphaGo. Google created a computer program that learned to play the abstract board game called Go, a game known for requiring sharp intellect and intuition. By playing against professional Go players, AlphaGo's deep learning model learned how to play at a level not seen before in artificial intelligence, and all without being told when it should made a specific move (as it would with a standard machine learning model). It caused quite a stir when AlphaGo defeated multiple world-renowned "masters" of the game; not only could a machine grasp the complex and abstract aspects of the game, it was becoming one of the greatest players of it as well.

To recap the differences between the two:

- Machine learning uses algorithms to parse data, learn from that data, and make informed decisions based on what it has learned

- Deep learning structures algorithms in layers to create an "artificial neural network" that can learn and make intelligent decisions on its own

- Deep learning is a subfield of machine learning. While both fall under the broad category of artificial intelligence, deep learning is what powers the most human-like artificial intelligence

A simple explanation

...still seem complicated. The easiest takeaway for ...e between machine learning and deep learning is to know that ...arning.

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An analogy to be excited about

Another thing to be excited about with deep learning, and a key part in understanding why it's becoming so popular, is that it's powered by massive amounts of data. The "Big Data Era" of technology is providing huge amounts of opportunities for new innovations in deep learning. We're bound to see things in the next 10 years that we can't even fathom yet.

Andrew Ng, the chief scientist of China's major search engine Baidu and one of the leaders of the Google Brain Project, shared a great analogy for deep learning with Wired Magazine: "I think AI is akin to building a rocket ship. You need a huge engine and a lot of fuel," he told Wired journalist Caleb Garling. "If you have a large engine and a tiny amount of fuel, you won't make it to orbit. If you have a tiny engine and a ton of fuel, you can't even lift off. To build a rocket you need a huge engine and a lot of fuel."

"The analogy to deep learning is that the rocket engine is the deep learning models and the fuel is the huge amounts of data we can feed to these algorithms."
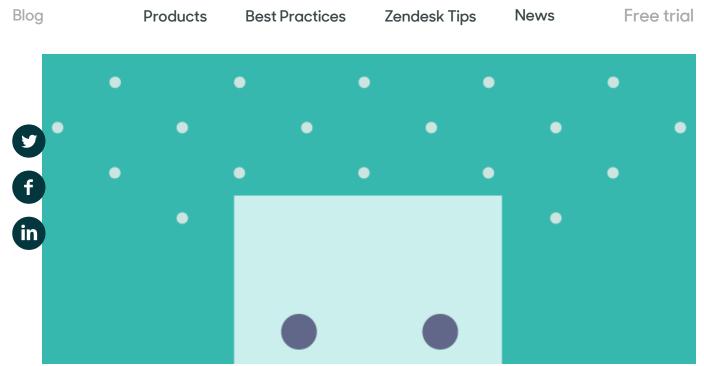
— *Andrew Ng (source: Wired)*

So what do machine learning and deep learning mean for customer service?

Many of today's AI applications in customer service utilize machine learning algorithms, ~~~~e, increase agent productivity, and make workflows more ~~~~hose algorithms comes from a constant flux of incoming ~~~~turn leads to quick and accurate predictions. Artificial

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And as deep learning becomes more refined, we'll see even more advanced applications of artificial intelligence in customer service. A great example is Zendesk's own Answer Bot, which incorporates a deep learning model to understand the context of a support ticket and learn which help articles it should suggest to a customer.
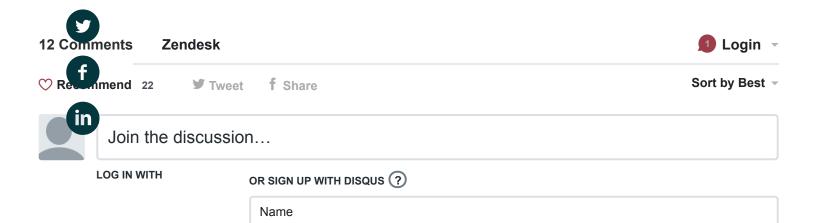
Expect to see even more innovative applications of deep learning in the near future (especially in self-service), and expect machines to provide even better personalized assistance to customer service representatives.

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Name

Andrea Maria • a year ago
Yes, I agree with this article. Machine learning is a subfield of artificial intelligence and computer science that allows software applications to be more accurate in predicting results. Deep learning is a subfield of machine learning.
1 ∧ | ∨ • Reply • Share ›

Krishna • 2 months ago
I agree, Learn in below format Machine Learning First, then Deep learning, AI, also learn Data science.
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phani cbse • 3 months ago
ML and AI are really getting matured in last six months.
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Mity • 9 months ago
Good.Further simpler explanation is required for those with lesser knowledge of the subject.thanks
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Mity • 9 months ago
What I understand is the computation of adding weights to eliminate the error and reach a point as close
attern followed for deep learning in ANN.Could someone clarify this

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e added by an engineer to fine tune the outcome or reduce the error on

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feed for DL is Bigdata, and in near future most of the real data going to be through IoT.

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Hammad Zahid Ali • 10 months ago

nice article very informative

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Tangeni M. Shikomba • 10 months ago

Well explained!

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Saba Khan • 10 months ago

Excellent explanation.

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Cedric Chee • a year ago

In my opinion, this article is among the better ones explaining ML vs DL. Better than NVIDIA's article here:
https://blogs.nvidia.com/bl...

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Sah Swapnil Agrawal • a year ago

nicely explained

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