
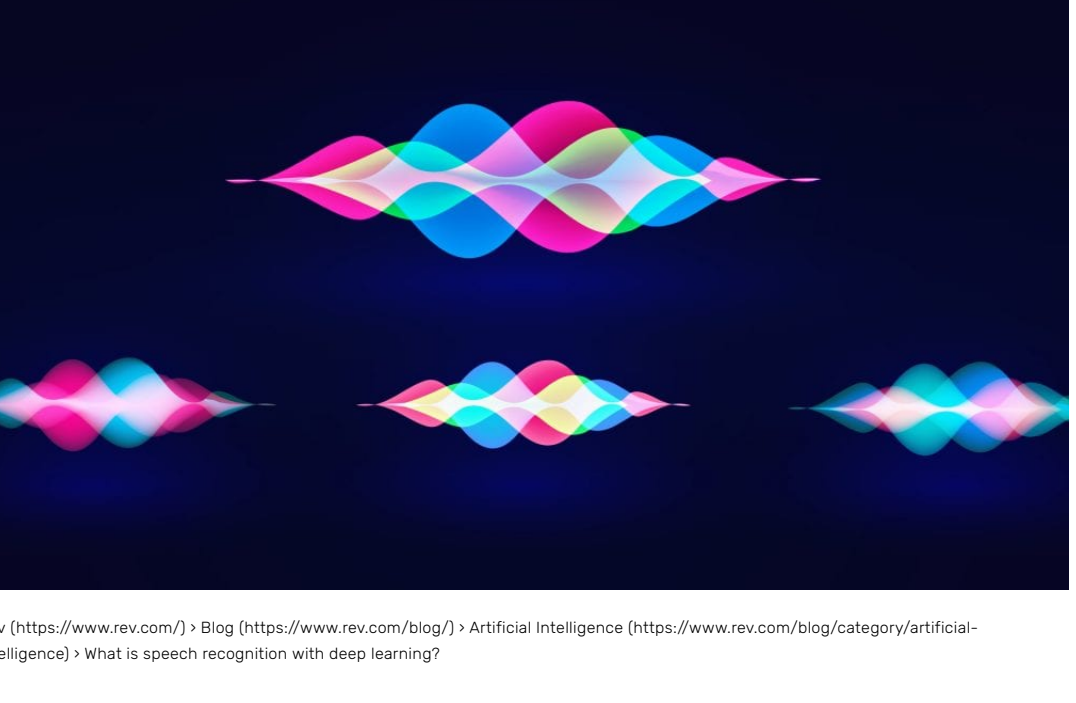


What is speech recognition with deep learning?



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We are in the midst of a revolution (<https://www.rev.ai/>) in the science of speech recognition.

A technology which has been around for decades, it is only in recent years that radical advances in artificial intelligence, machine learning and deep learning have brought it to the fore.

Now it permeates every aspect of our lives. From how we communicate with phones and search the web, to interact with virtual assistants and even our cars.

All of this has been achieved with a level of precision and accuracy that could only be dreamt of just a few short years ago.

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The origins of speech recognition

While speech recognition has been around for decades, it was unrecognizable to the technology we use today.

The first stirrings of what we see now began at the iconic Bell Labs in 1952. Known as Audrey (<https://www.bbc.com/future/article/20170214-the-machines-that-learned-to-listen>), the system was designed to recognize numbers rather than words and could discern a human voice saying digits out loud.

But it was not until a decade later when the first speech recognition system learned to understand words.

The role of artificial intelligence

The biggest gamechanger in speech recognition has been AI. That is because speech is about more than just words.

On its most basic level, speech recognition is about interpreting soundwaves (https://www.youtube.com/watch?v=uhjY_QbAIng) and assigning meaning. This would be much easier if people spoke succinctly and with the same tone and speed.

But humans are curious creatures and language is not just a case of stringing words together. Words can have different meanings, and a computer's job is made tougher by things such as slang and accents.

In order for a computer to truly comprehend what a human is saying, it is also important for it to be able to understand what the individual words might mean in the context of complete sentences.

With a biological brain, as a human being grows and is increasingly exposed to language, so too is their brain able to place the words they hear into context and give them meaning.

This is a major hurdle for computers, which traditionally have only been able to respond to challenges with a set of pre-programmed responses.

Older systems had to be pre-programmed with solutions to possible problems, but this meant they could only handle the variables which their human programmer could foresee. If a problem lay outside those boundaries, the computer was stumped.

But artificial intelligence (<https://www.rev.com/blog/artificial-intelligence-machine-learning-speech-recognition>) has changed that. Specifically, a subset of artificial intelligence called machine learning, which has revolutionized automatic speech recognition.

The rise of machine learning

Unlike traditional programming which equips a system with only a binary 'right or wrong' solution to a predicted problem, machine learning (<https://www.rev.com/blog/artificial-intelligence-vs-machine-learning-whats-the-difference>) teaches the system instead to recognize patterns.

This is essential in something as nuanced as human speech, where there is not always a right and wrong answer to the question of 'is that the correct word or not?' and 'which word should come next?'.

To do so, the system must be input with large amounts of structured training data so it can learn from that data and identify patterns.

By doing so, the system is effectively able to teach itself without being repeatedly reprogrammed by a human, honing its ability to recognize those patterns with increasing accuracy over time.

With speech recognition, this means speech recognition algorithms becomes more attuned to human speech the more the system is exposed to it.

This enables the system to select the best algorithms for speech recognition in any given situation, enabling it to 'fill in the blanks' when something such as poor diction, strong accents or faulty recording equipment hamper the process.

Deep leaning in speech recognition

One issue with machine learning (<https://parsers.me/deep-learning-machine-learning-whats-the-difference/>) is that it still relies on a degree of handholding by a human programmer.

The human will have to input structured straining data which is clearly defined to enable the system to recognize it.

As the system repeats this process it becomes more accurate, but the human component is still vital.

But speech recognition with deep learning deep learning works more like a human brain. It harnesses artificial neural networks (ANN), which have been inspired by the biological neural network of the human brain.

While machine learning has to rely on inputted training data and be steered towards the right decisions, speech recognition deep learning harnesses layers of ANN to essentially make its own decisions about what the right solution to a given problem might be.

Applications of deep learning are wide and varied, with deep learning for speech recognition and related applications making it possible to predict what a human is saying with a much greater degree of accuracy.

This new dawn in speech-to-text technology means our powerful tools can revolutionize how you perform tasks such as live captioning, video captioning and transcription.

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