How Artificial Intelligence Has Crept Into Our Everyday Lives

Machines are writing news articles, composing music, and preventing credit card fraud

By **AMANDA DAVIS (/author/davis-amanda)** 8 June 2016

Artificial intelligence has crept into our everyday lives, even though we're not always aware of it. Here are some examples of AI's many applications.

(1) MAKING HEADLINES

Illustration: Eric Frommelt

Journalists might not care for this, but AI programs are becoming smart enough to compile bits of information and turn them into articles. Although long-form features and investigative pieces are still being left to reporters, the Associated Press, Fox News, Yahoo, and other outlets are using AI to fill in the blanks of simple, data-driven stories, like financial summaries and sports score recaps.

Last year, **Automated Insights (https://automatedinsights.com/)**, a software company in Durham, N.C., launched Wordsmith, the world's first natural language template engine, which allows anyone to generate automated content, including journalists who want to publish news articles about stock market figures or baseball stats.

But it isn't just filling in the blanks: Each article Wordsmith generates is completely unique, derived from the underlying data in a template.*

Wired magazine really put Wordsmith to the test by using it to write an obituary for IEEE Life Fellow **Marvin Minsky (http://spectrum.ieee.org/computing/software/marvin-minskys-legacy-of-students-and-ideas)**, the AI pioneer who died in January. The bot produced a 150-word "just the facts" obituary with such information as Minsky's name and age, the cause of death, and names of family members—which could be useful if a news outlet wants to be the first to publish the story.

There's also an AI program to write clickbait headlines—the kind designed to drive online readers to an article. The program uses recurrent neural networks (RNNs), which form connections based

on the data they receive.

After uploading and practicing on several million articles from BuzzFeed, Gawker, The Huffington Post, and other sites, the software has produced a number of grammatically correct—yet offbeat—headlines such as “How to Get Your Kids to See the Light” and “This Guy Thinks His Cat Was Drunk for Five Years.”

As its creator, Lars Eidnes, explained in a blog post, “We can show an RNN a bunch of sentences and get it to predict the next word, given the previous words. So, given a string of words like Which Disney Character Are, we want the program to produce a reasonable guess, like You, rather than, say, Spreadsheet.”

Eidnes has launched an auto-generated news site, Click-o-Tron, which adds headlines to short articles—all assembled by the RNN program.

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(2) LETTING GO OF THE WHEEL

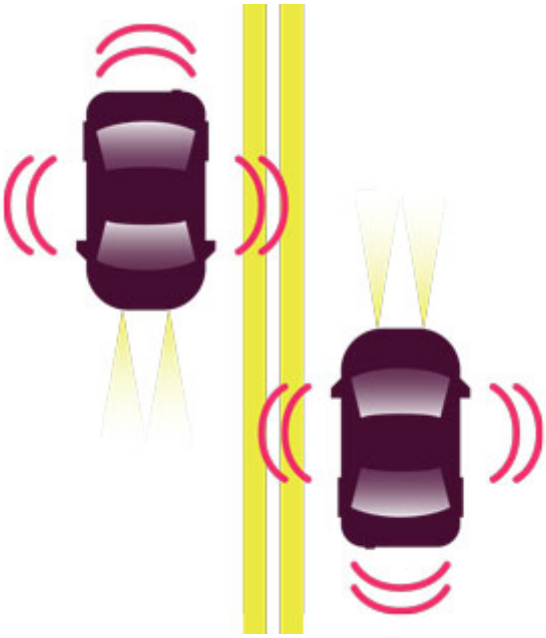

Illustration: Eric Frommelt

Self-driving cars might be a few years from the showroom floor, but several manufacturers have already incorporated AI in their cars.

This year BMW introduced its 750i xDrive model, the first car that can park itself with no one behind the wheel. Simply press a button on the car’s remote and the full-size sedan backs out of a driveway or maneuvers itself into a tight parking space.

The 2015 Infiniti Q50S and the 2015 Mercedes-Benz S65 AMG have systems of sensors that engage the brakes when the car comes too close to the vehicle in front, an object on the road, or a pedestrian. Such models also have a lane assist feature, which adjusts the car’s course when it begins to drift.

In January, Toyota hired IEEE Member Gill Pratt, a robotics expert, as CEO of its research institute, and it plans to spend US $50 million to support collaborative AI research at Stanford and MIT. The company is working on a camera that can read road signs and determine the colors of traffic signals—which could help vehicles get through intersections safely.

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(3) INTELLIGENT PLAY

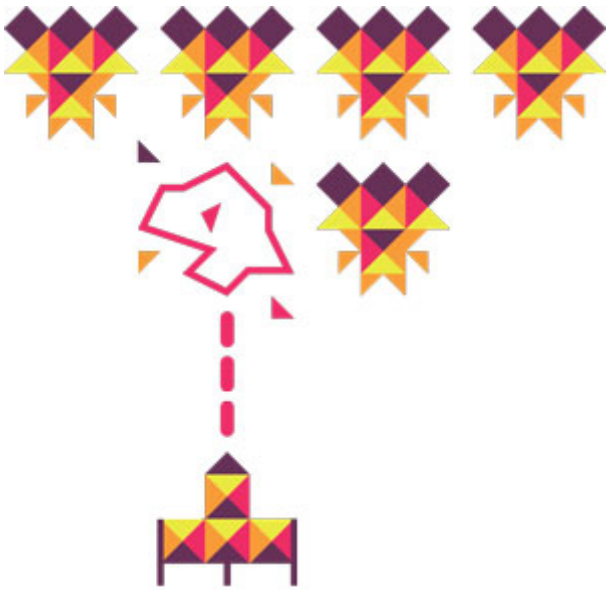

Illustration: Eric Frommelt

AI programs can keep gamers on their toes as their computer-based opponents become less predictable. First-person shooter games, like Call of Duty, make significant use of AI to enable the background characters to analyze their surroundings to find objects or take actions that might be crucial to their survival. The characters take cover, investigate sounds, and communicate with other AI characters to increase their chances of victory.

Another game, Left 4 Dead, features an AI "director." The director isn't an onscreen character but an invisible force that increases the number of opponents to beat as the game progresses based on each player's situation, status, skill level, and location.

In fact, AI has been part of video games for more than 60 years. An early example was Nimrod, a computer designed for the 1951 Festival of Britain exhibition by IEEE Life Member John Bennett and built by engineer Raymond Stuart-Williams. Exhibition attendees could play Nim, a mathematical game of strategy, against the computer. The player would make moves by pressing buttons on a panel, with each button corresponding to a light on the machine; the computer would run through calculations to make its next move based on the player's actions.

The 1978 game Space Invaders introduced AI into computer-generated opponents, whose movements depended on the player's input. The Sims, one of the best-selling computer games of all time and still on the market, premiered in 2000 and took AI a step further. Players create characters, build houses for them, and assign them careers, but the characters exhibit a certain degree of free will, reacting to situations (such as meeting new neighbors or dealing with kitchen fires) in somewhat unpredictable ways.

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(4) FOR YOUR ENTERTAINMENT

Are you bored with your current music playlist or can't decide which TV show to watch? AI might be able to help. Netflix, Pandora, Spotify, and other streaming services use the technology to recommend movies and music based on their customers' past selections. By applying deep-learning algorithms, the services make recommendations that their subscribers are likely to enjoy.

To make accurate choices, the companies' programmers manually tag songs, movies, and TV shows with certain traits. A song on Pandora, for example, might have deep bass and dynamic vocals listed as traits. If you listen to such a song all the way through, AI selects another one with similar attributes.

Illustration: Eric Frommelt

Not only are computers now selecting music, but they're also composing it. Researchers at the Sony Computer Science Lab, in Paris, are working on algorithms to let computers produce original symphonies and other music.

A symphony could be in the style of composer Johann Sebastian Bach, for example, or the AI could produce riffs that sound like, say, jazz musician John Coltrane's, or original melodies that conjure up a particular pop star. The jazz bot can even come up with songs that combine the attributes of two musicians, such as a tune that sounds like it was written by composer and conductor Pierre Boulez and played by saxophonist Charlie Parker.

"The commercial applications of such efforts may include endless streams of original music in shopping malls that can respond to crying babies with soothing harmonies, as well as time-saving tools for busy composers," says William Hochberg, who wrote about the technology in The Atlantic.

But can computer-composed music move an audience the way live music can? Is it able to replicate nuances, like a singer's imperfect vibrato or a blues musician's soulful strum of a bass guitar? AI has a ways to go, according to Hochberg. Oftentimes "ham-fisted dynamics and pointless melodies" make it clear, he says, that the song wasn't composed or performed by a human.

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(5) FRAUD PREVENTION

It's a scenario becoming familiar to more and more people: You go to a café to grab a cup of coffee, only to have your credit card declined. Minutes later, you receive notice that your card has been suspended because a large purchase was made by someone at a store on the other side of the globe. Your account is frozen, and a new card arrives in the mail several days later.

AI and data-analysis programs work together to stop thieves. AI systems are fed a large sample of normal and fraudulent transactions so they can learn what each type looks like. If, for example, a client typically makes most of her credit card purchases locally, and then buys a high-priced item in another state or country, the system flags the transaction.

Similar technology has been in place since the late 1990s, but as IEEE Member Jungwoo Ryoo says in an article on The Conversation, an online research publication, the process has now become almost instantaneous.

Illustration: Eric Frommelt

The algorithms in use today can handle more data and do it faster, making the job of fraud detection not only less labor-intensive but also more accurate, says Ryoo, associate professor of information sciences and technology at Pennsylvania State University, in State College. That is important for companies such as PayPal, which processes some 1.1 petabytes of data at any given moment. Because AI improves through practice, every new piece of information makes the system that much smarter and more efficient.