

CLOUDERA: THE MIND OF THE NEW MACHINE

Mike Olson abhors the term *artificial intelligence*. As co-founder and chief strategy officer of Cloudera, he has seen first-hand the advances that computers have made in recent years. But they are not, he believes, intelligent yet, in any meaningful sense.

Founded in 2008, Cloudera is the first provider and supporter of Apache Hadoop for enterprises. They have experienced hyper-growth as a business on the back of an explosion in big data of their customers. With funding of \$670 million to date and 1,200 employees worldwide, Cloudera offers customers open source software that handles the thorniest big data challenges, from storage to analysis.

Artificial intelligence (AI), says Olson, is an inaccurate descriptor. We still do not know enough about how human intelligence works to replicate it artificially any time soon. For another, AI conjures up scary images of the eerily sentient HAL 9000, from *2001: A Space Odyssey*, or autonomous Terminators making creative, spur-of-the-moment decisions, to execute their program of human destruction. Thankfully, machines like those remain in the realm of science-fiction.

"I am not worried that the Matrix is going to wake up one day and decide to eliminate humanity," Olson says.

What Olson is witnessing instead is the rapid development of machines capable of learning—perhaps to a lesser extent than AI promises, but enough to hold out great and real possibilities right now for enterprises and for us.

"The computer algorithms we're building now are really good in the narrow domains in which they work, but they are not human in character," Olson explains. They are not generalists, as we are. Companies can teach a neural network to recognize faces—often better than a human can. But the machine will be face-specific; it will not recognize a pizza.

"These are special purpose-algorithms trained on a specific set of input data, great at noticing patterns, and great at recognizing those patterns in new data," Olson says. Over time, these systems advance within their domains. "These machines do ingest data and use the data to build models on which they make predictions," he explains.

"And the more data you show them, the better they are at doing that. In that sense, they are learning."

Olson predicts that these learning engines will proliferate rapidly. "We are going to be surrounded by these agents that are good at very narrow, predictive applications. And rather than some massive, global, artificial intelligence developing, we are going to be surrounded by special-purpose systems that we interact with on a day-by-day basis. That is going to be a huge change in the way that we work."

Organizations have had the ability to teach computers for decades by inputting data. But only recently have they had the large volumes of data, huge compute capabilities, and real-time analytics platforms that are necessary for these systems to teach themselves. "Now, at places like Google, Facebook, and elsewhere, those systems are easy and cheap to get," says Olson. "The result is that these relatively mature algorithms are suddenly effective in ways they never were before."

CASE STUDY

Machine learning is proving very powerful in industries as varied as healthcare, finance, energy, and retail. Cloudera uses machine learning to predict when its own customers' computing clusters may be about to experience a problem, and then the company solves it for them before they ever have to call customer service. One Cloudera customer, a U.S. financial regulatory authority, uses machine learning to look at complex patterns in trading to spot illegal collusion between banks. Electronic medical records company Cerner is working with Cloudera on algorithms that can notify hospitals when a patient is likely to become septic. This system has already saved hundreds of lives.

"We have gotten really good at deploying these algorithms against specific problems and getting shockingly good results," Olson says. "Computers now are better at vision than people. If you have got a diagnostic image or an x-ray, you would actually rather have a computer look at it and give the doctor its interpretation than rely on a human radiologist who may be tired, or may simply miss something."

Olson believes it is critical for Cloudera, now an established tech player, to continue to explore the many technologies emerging around machine learning. He worries that companies often fail to recognize or properly value disruptive innovations because they are focused on protecting their existing business models.

These companies, says Olson, "are operating at the very peak of their markets, and emerging technologies that look to be of lower value, but solve different kinds of problems, are consistently missed."

As Cloudera's chief strategy officer, Olson does not need a machine to recognize that pattern, nor an artificial intelligence to tell him about its risks. So he plans to keep his eyes wide open and focused on the future.