Making artificial intelligence a reality for agriculture

BY PETER GREDIG

There are many definitions of artificial intelligence (AI), but in plain terms the concept describes how a computer or machine can emulate a human by processing information and data and generate a response or action to get a job done properly.

Artificial intelligence has been anticipated by science fiction for decades. But the availability of enormous volumes of data and high speed computing is helping make AI a mainstream technology.

Examples include voice recognition software, customer service bots and autonomous cars.

If you ask Siri if you need an umbrella today, she recognizes that you are asking if it's going to rain.

When you use a customer support chat forum to get help with a product, a new router for example, you are almost certainly communicating with a chatbot that uses AI software to respond to your query.

An autonomous car is using GPS data, information coming from numerous sensors on the vehicle and driving protocols programmed into the car to make the appropriate driving decisions.

In all these examples, AI software is accessing data and generating a response that has traditionally been done by humans.

This word "decision" really helps to define how AI is poised to impact agriculture. Just

The availability of enormous volumes of data and high speed computing is helping make AI a mainstream technology.

as it's helping doctors make better diagnoses for cancer patients by accessing huge banks of data and previous outcomes, the potential is for AI to assist or automate specific management decisions currently made by farmers.

Supercomputers that can process millions (yes, millions) of equations per second could allow all manner of data from Internet-connected field sensors, weather stations, drones, etc., to be combined with seed product characteristics, crop and input prices, and more to predict or automate decisions relating to which seed to plant, when to plant it, the optimal fertilizer rate, irrigation decisions, and so on.

To date, most artificial intelligence is really driven by the formulas or algorithms developed and installed by humans. For example, if the variables indicate that irrigation should be turned on, the software

will make it so. We've built the formula that enables the software to generate a decision.

The next stage of artificial intelligence is sometimes referred to as machine learning. Instead of relying on defined programming (if the data is x, the output is y), the concept of machine learning is to program the software to recognize patterns so it can learn how to respond appropriately, getting better and better with each iteration. This is a crude simulation of how the human brain actually works.

Will artificial intelligence replace the knowledge and intuition that farmers have always relied on to help manage their farms? Probably not – but it will complement and challenge how decisions are made, especially as our ability to generate and collect all manner of data continues to expand. ∎

VIDEO: Embracing Innovation with David and Sara Simmons of Pure Holsteins. | **fcc.ca/Pure**