Abstract

Artificial intelligence (AI) is beginning to live up to its promise of delivering real value, driven by recent advances in the availability of relevant data, computation and algorithms. In this paper, I discuss the value to agriculture from AI over the next decade. The more immediate applications will be to improve precision information about what is happening on the farm by improving what is being detected and measured. A consequence of this is more accurate alerts to farmers. Another is increased ability to understand why phenomena occur in farm systems in order to improve their management. From improved data and understanding comes improved predictions, enabling more optimal decisions about how to manage farm systems and stimulating the development of decision support and recommender systems. In many cases, robotics and automated systems will remove much of the need for human decision making and improve farm efficiencies and farm health.

Artificial intelligence will also be needed to enable organisations to harness the value of information distributed throughout supply chains, including farm data. Digital twins will also emerge as an important paradigm to improve how information about farm entities is organised to support decision making. There are also likely to be negative impacts from AI, such as disruption to the roles and skills needed from farm workers, indicating the need to consider the social and ethical impacts of AI each time a new capability is introduced. I conclude that understanding these challenges more deeply tends to highlight new opportunities for positive change.