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The Deep Learning Revolution

Machine learning today is one of the most important, and fastest growing, fields of technology. Applications of machine learning are becoming ubiquitous, and solutions learned from data are increasingly displacing traditional hand-crafted algorithms. This has not only led to improved performance for existing technologies but has opened the door to a vast range of new capabilities that would be inconceivable if new algorithms had to be designed explicitly by hand.

One particular branch of machine learning, known as *deep learning*, has emerged as an exceptionally powerful and general-purpose framework for learning from data. Deep learning is based on computational models called *neural networks* which were originally inspired by mechanisms of learning and information processing in the human brain. The field of *artificial intelligence*, or AI, seeks to recreate the powerful capabilities of the brain in machines, and today the terms machine learning and AI are often used interchangeably. Many of the AI systems in current use represent ap-