Machine learning is a subset of artificial intelligence (AI) focused on the development of algorithms and statistical models that enable computers to perform tasks without explicit instructions, relying instead on patterns and inference derived from data. The concept of machine learning was first introduced in the mid-20th century by Arthur Samuel, who coined the term "machine learning" in 1959. Samuel defined it as a "field of study that gives computers the ability to learn without being explicitly programmed."

The field of machine learning has seen significant evolution since its inception. In the 1980s and 1990s, the development of deep learning and artificial neural networks marked a major advancement. A pivotal moment came in 1986 when Geoffrey Hinton and his colleagues introduced the backpropagation algorithm, which became a fundamental technique for training neural networks.

In recent years, machine learning has experienced tremendous growth due to advancements in computational power and the explosion of data. Modern applications of machine learning are diverse, encompassing areas such as speech recognition, image recognition, natural language processing, recommendation systems, and industrial automation.

Prominent figures like Geoffrey Hinton, Yann LeCun, and Andrew Ng have made significant contributions to the field, pushing the

boundaries of what machine learning can achieve. Tools and libraries like TensorFlow, PyTorch, and scikit-learn have further democratized access to machine learning, making it easier for researchers and developers to create and deploy sophisticated models.