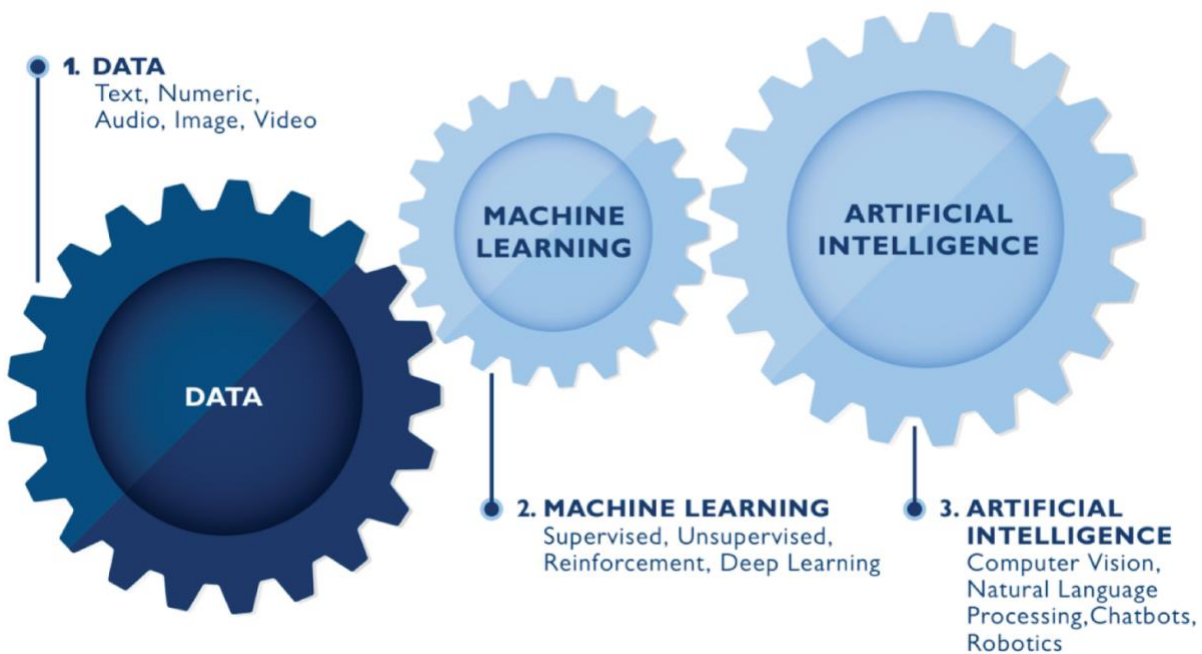




Artificial Intelligence (AI) Ethics Workshop for Nonprofits

December 2020

Artificial Intelligence and Machine Learning: Key Terms and Definitions



Machine Learning (ML) is a set of methods for getting computers to recognize patterns in data and use these patterns to make future predictions. For shorthand, you could think of ML as “data-driven predictions.”



Artificial Intelligence (AI) uses computers for automated decision-making that is meant to mimic human-like intelligence. Automated decisions might be directly implemented (e.g., in robotics) or suggested to a human decision-maker (e.g., product recommendations in online shopping); the most important thing for our purpose is that some decision process is being automated. For shorthand, you can think of AI as “smart automation.”

Big Data: A set of technologies developed to handle data sources that are “big” in terms of volume, velocity, or variety. While the term “Big Data” emphasizes data management more than learning and predictions, many former Big Data companies have rebranded themselves as AI companies, and there is broad overlap in tools and techniques.

Types of Machine Learning

Supervised learning: Given a set of labeled training data, learn to predict labels for unlabeled data.
Estimate the probability of loan repayment based on financial data from past borrowers.

Unsupervised learning: Find patterns or structure in a dataset
Determine whether potential borrowers comprise several distinct groups, for which different loan products could be designed.

Reinforcement learning: Reward-based training system, maximizing its chances of achieving a well-defined goal
Currently most useful for robotics and autonomous vehicles (and Go)

Deep learning is part of a broader family of machine learning methods based on artificial neural networks. **Artificial neural networks (ANN)** are computing systems that are inspired by, but not identical to, biological neural networks. They can be trained to match inputs to specific outputs by adjusting parameters within the neural net.
Can be used for supervised, unsupervised, or reinforcement ML

Key AI Capabilities

- **Natural language processing (NLP)** analyzes or synthesizes “natural” human languages such as English, Spanish, or Arabic.
- **Computer vision** processes images or video in order to identify objects or interpret scenes or events.





- **Speech or audio recognition** analyzes audio files to recognize specific sounds or speech patterns. Speech recognition often relies on NLP to transcribe speech into written text.
- **Advanced Analytics** carries out sophisticated analysis of multiple data sources, structures.
- **Content Generation** creates new text, images, video from understanding of key patterns in training text, images, video.

Developing and using AI / ML: It's a process

