Ami Ashman

Introduction to AI in Python

2/5/22

Module 2: AI vs. ML vs. DL Article

“Explain the differences between Artificial Intelligence, Machine Learning, and Deep Learning.”

Of course, Mr. Chairman! Artificial Intelligence, Machine Learning, and Deep Learning are all elements of the branch of computer science in which computing power is used to replicate human functionality. They exist in a hierarchy: Deep Learning is encompassed by Machine Learning, which is encompassed Artificial Intelligence.

At the bottom, Deep Learning is the closest of the three to the technical function of the human brain. It uses neural networks to manipulate input data, specifically through weighed sums and other mathematical operations, then passes it on to the next layer. The neural network is a network due to the plethora of hidden layers sandwiched between the input and output layers. These hidden layers make deep learning *deep* as the increase to functionality of the neural network. Altogether, the neural network can be trained on known data sets to improve its accuracy.

These neural networks are superbly useful for regression, a supervised learning algorithm which models the relationship between variables. Examples include price estimation, such as estimating used car prices based on metrics of condition (such as milage or production year); image detection, which uses pixel values as inputs to determine the object in the image; and weather prediction by using past weather data. These and other processes have revolutionized the healthcare, transportation, and tourism industries, to name a few.

The next step up is Machine Learning, which uses algorithms and computations, such as deep learning and neural networks, to improve at projects by past experience. ML algorithms follow a learning process, by which algorithms take in and train themselves on a data set, then are tested on new data to hone efficiency at a specific task. Unlike deep learning, which is based solely on neural networks, machine learning includes many different procedures, for example classification, recommendation, and clustering, which different algorithms being suited for different problems. Machine learning can be used to recommend which show to watch next on services such as Netflix, recognize irregular or abnormal credit card usage to stop fraud or scams, and classifying drivers as high- or low-risk to set insurance prices.

Finally, and at the top of the mountain, we have Artificial Intelligence. AI incorporates machine learning algorithms to mimic human intelligence with computers. People have used AI to create sentient Twitter bots (Microsoft Tay), compose music (Google Bach Doodle), and recognize human speech, which can power application such as Amazon Alexa and Apple’s Siri.

“What an excellent presentation, Ami!”

Thank you, Mr. Chairman!