FINANCIAL RISK
GROUP

New Machinist Journal

What Artificial Intelligence and Machine Learning Solutions Offer

Dr. Jimmie Lenz

Machinist (noun): A person who operates a machine, especially a machine tool

This is the first in a new series of articles spotlighting the new machinist and their output.

The machine tools of the new machinist are Artificial Intelligence (AI) and Machine Learning (ML), which this paper introduces and subsequent papers will delve into the output of, as well as the craftspeople that wield these tools. Artificial Intelligence ("AI") and Machine Learning ("ML") are mainstays of modern media, as both technologies have captured the attention of both the scientific and entertainment communities. The prognostications about their applications, many of which seem to draw primarily from science fictions, are now materializing in some interesting (and at times controversial) ways. An expected outcome has been scientists utilizing the output of learning algorithms to "nudge" us into certain behaviors—e.g., buying stuff. Meanwhile, the entertainment industry's creative application provides, at best, totally new paradigms, and at least, something beyond the expected. The value in these technologies can be truly realized in this ability to create a new way in which problems are considered and solved.

Background

AI is generally considered to have been identified in academia in the 1950s as a mechanical process that can "learn" and adapt like a human. In practice this is the ability to consider environmental factors that might affect the attainment of a goal in the assessment and choice of the best options available. A number of firms that are pursuing self-driving vehicles are demonstrating this type of logic, incorporating the ability to assess a dynamically-changing environment (the roadway, pedestrians, other data points) and calculate the best response to avoid any type of accident, while delivering the passengers to their destination in the most efficient manner possible.

Machine learning is similar but different, and it seems the early description of computational statistics provides a good basis from which to differentiate AI. ML can be used to determine the best probable choices from the data provided and "learn" the best one by assessing different combinations of choices: for example, determining the best fit when creating a distribution curve that has hundreds of potential variables.

While both AI and ML provide no shortage of possibilities across all industries, we are just starting to enjoy their practical applications. However, we need to use these tools to develop creative ideas and solutions, rather than just furthering (or in some cases complicating) existing applications.

Current Environment

FRG is, at its core, a firm with roots in the practical application of technology in facilitating computational sciences to solve all types of problems. Our continued commitment to researching innovative client solutions is simply part of the DNA of the firm. As such, we have developed processes and applications that have been deployed as components of solutions in industries as large as Financial Services and Energy. These solutions are the result of a research function that is not only core to the firm, but also what continues to move it forward.

As a technology firm FRG believes future success is dictated by continually reviewing new technologies and innovating from them. To that end, we have researched and built machine learning proof-of-concepts. Our goal is to fully understand this space in practical applications as a precursor to work in the realm of AI. This White Paper is an introduction to a series that will explore in more detail actual applications of ML in many

different environments and use cases. These papers will provide perspective on the research, approach, and the solutions, as well as some information on the professionals that are tasked with creating these solutions.

For more information on FRG's research in the areas of Artificial Intelligence and Machine Learning, please visit the website or contact the FRG Research Institute at Research@frgrisk.com.