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General Comment

See attached file(s)

Attachments

DataRobot Comment on NRC AI Strategy

1. Introduction

DataRobot has chosen to comment on several aspects of the NRC's AI Strategic Plan. We agree with the overall goal of this strategic plan "to ensure continued staff readiness to review and evaluate AI applications effectively and efficiently," but we have made comments on specific definitions and additional considerations under the strategic goals that we believe will make a stronger, and more expansive plan.

2. AI Definition and Expansion

The Nuclear Regulatory Commission (NRC) defines AI as a "a machine-based system that can go beyond defined results and scenarios and has the ability to emulate human-like perception, cognition, planning, learning, communication, or physical action." There are a variety of domains and categories that fall into this definition, including natural language processing, machine learning, and deep learning that were already mentioned in the document, but it is limited in scope. There are two additional categories that should be considered: time series and unsupervised learning. Time series is the forecasting of events based on historical data for either one or multiple series, and could be valuable for the NRC to consider especially with forecasting when their equipment might fail, or forecasting staffing needs for specific programs. There is tremendous value in using time series forecasting problems and utilizing these algorithms would expand the number and complexity of use cases that the NRC would consider under their AI strategy.

Additionally, in the introduction page of the document, the AI strategy "considers an evolving landscape where computers use data and unseen behavior to construct the underlying algorithmic model, draw inferences, and define the rules to achieve a task." While this is generally true for supervised algorithms where there data has been labeled to make inference, this leaves out unsupervised methods of modeling where there is no labeled data. These use cases are great for clustering and anomaly detection where the patterns are hard for analysts to discern. Including unsupervised learning into the definition also expands the use cases that could be considered.

3. Robotic Process Automation

We would also like to comment on Figure 1, a diagram that identifies specific categories under the umbrella term of Artificial Intelligence. This diagram categorizes natural language processing, deep learning, machine learning, and robotic process automation (RPA). While we generally agree with the first three mentioned, as they use probabilistic methods to compute outcomes, we believe that robotic process automation doesn't necessarily fall within that category. RPA does automate certain repetitive tasks, but it uses a rules-based system that a human has to manually define first. RPA does not use historical data and algorithms to produce

inference like the others do. It could be used to act on inference or information from the statistical outputs from NLP, ML, and deep learning, but it doesn't produce predictions.

4. Machine Learning Operations (MLOps)

Under Strategic Goal 1: Ensure NRC Readiness for Regulatory Decision-making, there is an urgency that “focuses on developing the regulatory guidance and tools to prepare the staff to assess 20 AI as part of NRC regulatory activities.” The deployment of these AI models and being able to serve them in a production environment is as crucial as developing them, and we believe that Machine Learning Operations (MLOps) must be considered in the strategic plan. The NRC must consider where they want to host these models, and what environment they can do so securely (whether that be on-premises, or on the cloud). Having an infrastructure to host and deploy these models is key to getting value out of AI.

Additionally, there are monitoring considerations in a deployed environment. Even the best models degrade over time due to differences in real-world data and the data that the models were trained on, and being able to track, identify, and retrain models on the newest set of data is imperative for any use case. In addition to the monitoring of these models, governance should play a role in whatever tools the NRC eventually uses. There should be user roles that limit who can create models, who can deploy them, and who can monitor them.

These models should also be extensible so they can support a variety of prediction methods including, but not limited to, batch predictions, real-time streaming, and scheduled jobs from a variety of existing databases.

5. Summary

To summarize our points from above, we believe that the definition of AI should expand to include both time series and unsupervised learning problems. We also believe that robotic process automation should help in creating actionable decisions from predictions made from true AI models, but isn't under artificial intelligence itself. Lastly, MLOps is essential in getting value out of these models and algorithms and for monitoring and management purposes.

We want to thank the NRC for allowing us to comment on the strategic plan. Please let us know if you have any questions.