Contribution ID: **17** Type: **Poster**

AI Data Quality Monitoring with Hydra

Monday, 24 October 2022 11:00 (30 minutes)

Hydra is an AI system employing off-the-shelf computer vision technologies aimed at autonomously monitoring data quality. Data quality monitoring is an essential step in modern experimentation and Nuclear Physics is no exception. Certain failures can be identified through alarms (e.g. electrical heartbeats) while others are more subtle and often require expert knowledge to identify and diagnose. In the GlueX experiment at Jefferson Laboratory data quality monitoring is a multistep, human in the loop process that begins with shift crews looking at a litany of plots (e.g. occupancy plots) which indicate the performance of detector subsystems. With the sheer complexity of the systems and number of plots needing to be monitored subtle issues can be, and are, missed. During its time in production (over 2 years) Hydra has lightened the load of shift takers of GlueX by autonomously monitoring detector systems. This talk will describe the construction, training, and operation of the Hydra system in GlueX as well as the ongoing work to develop and deploy the system with other experiments at Jefferson Laboratory and beyond.

Significance

This work represents an early deployment of an AI system in production using off-the-shelf technologies. It has been generalized and is being adopted by other experiments and shows a good foundation for the management and deployment of AI monitoring systems and dovetails with ongoing work in AI controls.

References

@article{ refId0,
author = {{Britton, Thomas} and {Lawrence, David} and {Rajput, Kishansingh}},
title = {AI Enabled Data Quality Monitoring with Hydra},
DOI= “10.1051/epjconf/202125104010”,
url= “https://doi.org/10.1051/epjconf/202125104010”,
journal = {EPJ Web Conf.},
year = 2021,
volume = 251,
pages = “04010”,
}

Experiment context, if any

GlueX, SBS, CLAS12

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Presenter: BRITTON, Thomas

Session Classification: Poster session with coffee break

Track Classification: Track 1: Computing Technology for Physics Research