HYDRA

Computer Vision for Data Quality Monitoring

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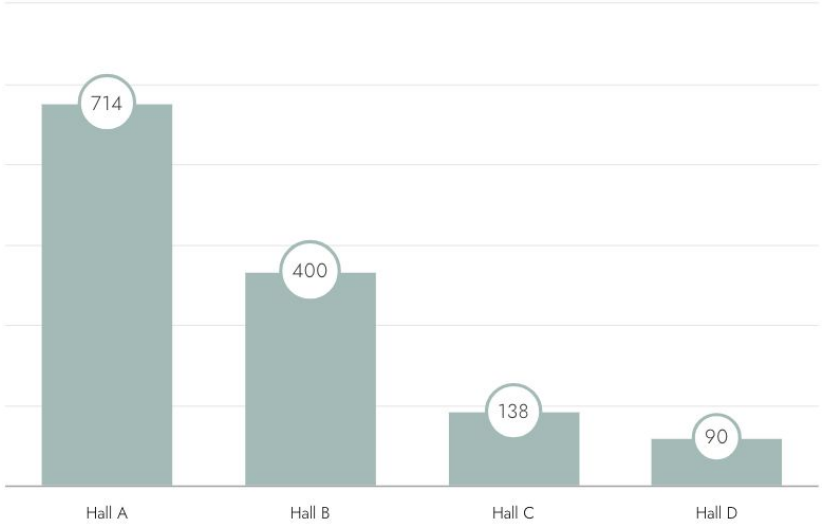
Hydra

- Shift takers should be looking at a lot of plots.
  - Thousands a day!
  - Monitoring is tedious and causes problems to be overlooked

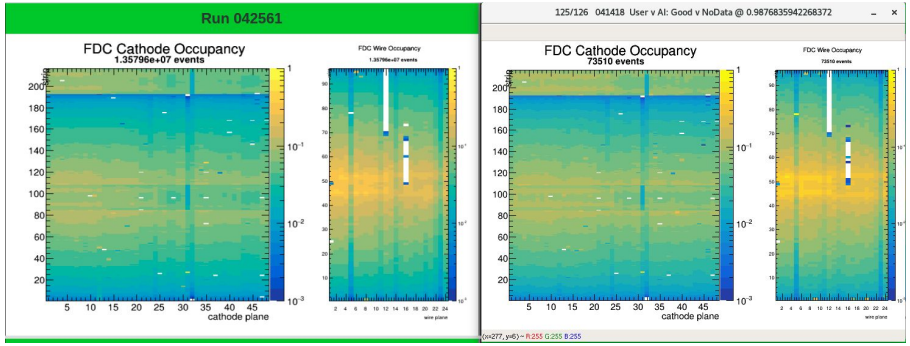
- Computer (vision) can help shift takers by looking at these plots
  - Introducing **Hydra**, an extensible framework for training and managing AI for near real-time monitoring

- **Hydra aims to be an AI shiftworker**
  - It enables shift workers to work "at scale" without the expertise
  - It informs experts and allows for easy training, deployment, and management of AI
  - Provides extra meta and time-series data that can inform maintenance and/or calibration



Approximate **number of individual histograms per experiment per run**, monitored by the shift crew for each experimental hall.

Status



The labeler was instructed by the detector expert to label any plot containing **fewer than 100k events as "NoData"**. This is one example of several in which the labeler labeled as "Good" and the **A.I. predicted "NoData"**...the true label given the number of events

HydraRun also saw the FDC problem, which I probably would have missed inspecting it by eye.

- Deployed in all <u>4 experimental</u> halls at JLab
  - Primarily utilizing Google's Inception v3
    - Most "well-trained" models >95% accurate
  - Features to reduce false positives
  - Robust UX to enable management of the system without much AI expertise
- Beginning to work on a dual phase system
  - Siamese models for generic anomaly detection