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Predicting Oxygen Sensor Failures at SNOLAB using Data Analysis and Machine Learning

Friday 18 August 2023 11:00 (15 minutes)

In the Cube Hall at SNOLAB there are ten zirconium oxide-based sensors that monitor for oxygen deficiency hazards in case of an inert gas leak from the NEWS-G or DEAP-3600 experiments. While important for safety, these sensors occasionally fail, which can disrupt research by triggering a false alarm and evacuation of the Cube Hall. In this presentation I detail my analysis of historic oxygen sensor data in search of predictive patterns in the periods leading up to failures. I also describe my efforts to train a machine learning model to predict failures, a task that was complicated by the relative rarity of failure events in the dataset. This talk will highlight some of the challenges of preparing raw data for use in machine learning, as well as important considerations when designing and evaluating machine learning models.

Topics - Please choose one:

Other

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