4th ICFA Beam Dynamics Mini-Workshop on Machine Learning Applications for Particle Accelerators

Tuesday, March 5, 2024 - Friday, March 8, 2024

Lahan Select Gyeongju, South Korea

Classifications

Anomaly Detection / Failure Prediction

Examples and techniques for detecting anomalies for various purposes including: failure prediction of physical subsystems, triggering data-archivers, and triggering other automations or human interventions.

Optimization & Control

This session focuses on optimization and control of various elements of the particle accelerator system or subsystems, including automatic or human initiated procedures.

Methods

While any machine learning task will involve models of systems, this session focuses on the various approaches and architectures of modeling and their performance. This includes simulations and surrogate models.

Infrastructure / Deployment Workflows

Software tool suites for managing data archiving, ML development and training, ML deployment, automated control, and ML monitoring. Includes DevOps, MLOps, and workflow automations.

Analysis & Diagnostics

This section focuses on exploratory data analysis of accelerator systems and beam diagnostic elements such as beam position monitors.

Tools for Humans

Unique ML use-cases beyond the beam.

Field Summaries

Institutional and field summaries.