

APS Scientific Computation Seminar Series

Speaker: Phil Maffettone, DPhil
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Title: Remote and On-the-Fly: Artificial Intelligence Driven Science in Laboratories and Central Facilities

Date: Monday, September 13, 2021

Time: 1:00 p.m. (Central Time)

Location: Microsoft Teams Meeting
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Hosts: Mathew Cherukara and Nicholas Schwarz

Abstract:

Beamline experiments at central facilities are increasingly demanding of remote, high-throughput, and adaptive operation conditions. To accommodate such needs, new approaches must be developed that enable on-the-fly decision making for data intensive challenges, and automated solutions for collecting data. This talk will outline a suite of advancements in autonomous experimentation for a diverse range of scientific problems. The discussion will span mobile robotics, Bayesian optimization and reinforcement learning for experiment planning, and deep and statistical learning for on-the-fly analysis and visualization of large datasets. At the core of this body of work is extended collaboration with domain experts and the leveraging of scalable, open-source infrastructure, including the Bluesky project. Rather than attempt to develop a one-size-fits-all solution for every experiment, the presentation will outline the pragmatic rationale for a federation of agents interfaced with streaming data.