APS Scientific Computation Seminar Series

Speaker: Yi Jiang, Beamline Data Scientist
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Title: Automatic Parameter Tuning for High-Resolution Ptychography

Date: December 5, 2022

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

Location: Join ZoomGov Meeting
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Hosts: Mathew Cherukara and Nicholas Schwarz

Abstract: Ptychography is a powerful computational technique in microscopy at all wavelengths and
              has enabled many applications, from semiconductors to biological specimens. In practice,
              obtaining accurate reconstructions requires simultaneously optimizing multiple parameters
              that are often selected based on trial-and-error, reducing the overall throughput, and even
              introducing human biases. In this talk, I will discuss an automatic parameter tuning
              framework based on Bayesian optimization (BO) with Gaussian processes. With minimal
              prior knowledge, the workflow can produce high-quality ptychographic reconstructions
              that are superior to the ones processed by experienced experts. We also extend BO to other
              applications, such as experimental designs and tomographic reconstruction.