

Session TBD

Kevin Yager- KEYNOTE

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“Exploiting Deep Learning for Automated Synchrotron Experiments”

Abstract

Modern scientific instruments generate data at unprecedented rates. Manual sorting, classification, and analysis of these data streams is impractical. Moreover, switching to automated streaming data analysis opens the door to innovative autonomous experiments, wherein the scientific instrument intelligently explores parameter spaces without human intervention. This talk will present recent progress in applying machine-learning methods to the classification of x-ray scattering datasets generated at synchrotron beamlines. We demonstrate how deep learning networks can be augmented by taking advantage of the known physics of the scientific problem, yielding vastly improved performance.

Bio

Kevin Yager is the group leader for the Electronic Nanomaterials group in the Center for Functional Nanomaterials at Brookhaven National Laboratory (CFN, BNL). He obtained his Ph.D. in 2006 from McGill University, Department of Chemistry, on photo-responsive polymers, and worked for 3 years as a guest researcher in the Polymers Division at the National Institute of Standards and Technology (NIST) developing neutron scattering methods. His current work at BNL focuses on self-assembled nanostructures, and structural characterization using x-ray scattering. Over the last few years, he has been part of a team designing and building new high-performance x-ray scattering instruments at BNL's National Synchrotron Light Source II (NSLS-II), including developing the hardware and software infrastructure necessary for autonomous experimentation.

