

Joint Workshop 4: Machine Learning at the Edge for Real-time Analysis and Experimental Steering at Synchrotron Light Sources and Nanoscale Centers

Monday, May 2, Afternoon

1:20 – 1:30 Mathew Cherukara, Chengjun Sun, Nicholas Schwarz, and Subramanian Sankaranarayanan (Argonne National Laboratory)
Welcome Day 1

Session 1 Edge Hardware (Chair: Mathew Cherukara)

1:30 – 2:00 Geetika Gupta (NVIDIA)
NVIDIA HPC+AI Platform for Edge to Datacenter

2:00 – 2:30 Pete Beckman (Argonne National Laboratory)
AI@Edge for Scientific Instruments in the Digital Continuum

2:30 – 3:00 Anakha Babu (Argonne National Laboratory)
Machine Learning at the Edge for Real-time Ptychography Data Analysis

3:00 – 3:30 Break

Session 2 Fast Training (Chair: Chengjun Sun)

3:30 – 4:00 Venkatram Vishwanath (Argonne National Laboratory)
Facilitating Real-time Analysis and AI for Experiments at the Argonne Leadership Computing Facility (ALCF)

4:00 – 4:30 Zhengchun Liu (Argonne National Laboratory)
Deep Learning Accelerated Real-time X-ray Diffraction Data Analysis at Edge

4:30 – 4:45 Closing Discussion Day 1

Tuesday, May 3, Afternoon

1:20 – 1:30 Mathew Cherukara, Chengjun Sun, Nicholas Schwarz, and Subramanian Sankaranarayanan (Argonne National Laboratory)
Welcome Day 2

Session 3 Scientific Applications (Chair: Subramanian Sankaranarayanan)

1:30 – 2:00 Apurva Mehta (SLAC National Accelerator Laboratory)
Leveraging Proximal Continuity to Estimate Background and Noise in Connected Datasets

2:00 – 2:30	Christopher Tassone (Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory) <i>SMASH-ML: Automating the Synthetic Discovery of Nanomaterials</i>
2:30 – 3:00	Maxim Ziatdinov (Oak Ridge National Laboratory) <i>Bayesian Active Learning for Scanning Probe and Electron Microscopies</i>
3:00 – 3:30	Break
Session 4	Workflows and Techniques (Chair: Nicholas Schwarz)
3:30 – 4:00	Phillip Maffetone (Brookhaven National Laboratory) <i>Remote and On-the-fly: Artificial Intelligence-driven Science at User Facilities</i>
4:00 – 4:30	Anthony Avarca (Argonne National Laboratory) <i>Intelligent Nanoscience Data Infrastructure: A Data Platform for Materials Research</i>
4:30 – 4:45	Closing Discussion Day 2