2nd workshop on Artificial Intelligence for the Electron Ion Collider

Report of Contributions

Contribution ID: **1** Type: **not specified**

Tutorial on Ax/Botorch: Multi-Objective Optimization

Monday, 10 October 2022 14:00 (45 minutes)

Presenter: BALANDAT, Max (Meta/AI Facebook)

Session Classification: AI/ML for Design

Contribution ID: **2**   Type: **not specified**

Adaptive experimentation to assist detector design at EIC: from ECCE to ePIC and beyond

Monday, 10 October 2022 14:55 (20 minutes)

Presenter: SURESH, karthik (University of Regina)

Session Classification: AI/ML for Design

Contribution ID: **3**

Type: **not specified**

ML application for beam optics control in the LHC

Monday, 10 October 2022 16:00 (20 minutes)

Particle accelerator optimization problems deal with non-linear,
multi-objective functions which depend on thousands of time-varying machine components and settings. These properties often meet the limitations of traditional optimization methods and make this problem a perfect candidate for
application of ML-based techniques. In this talk I will present, how ML can improve the control of the beams on the example of the LHC and give a short outlook on the ML application to accelerator design. Main focus of the presentation will be the application of decision tree - based methods to instrumentation faults detection, reconstruction and correction of magnet
errors, and supervised learning for virtual diagnostics, which enables to obtain accurate information of beam properties without time-costly measurements.

Presenter: FOL, Elena (CERN)

Session Classification: AI/ML for Design

Contribution ID: **4**

Type: **not specified**

AI/ML overview for accelerator design activities

Monday, 10 October 2022 16:25 (20 minutes)

Presenter: SATOGATA, Todd (Jefferson Lab)

Session Classification: AI/ML for Design

Contribution ID: **5**   Type: **not specified**

AI-driven detector design for the EIC

Monday, 10 October 2022 15:20 (20 minutes)

Presenter: NACHMAN, Benjamin

Session Classification: AI/ML for Design

Contribution ID: **6** Type: **not specified**

ML for QCD Analysis - 3D Imaging

Tuesday, 11 October 2022 10:00 (20 minutes)

Presenter: LIUTI, simonetta (university of virginia)

Session Classification: Experiment/Theory Connections

Contribution ID: **7**   Type: **not specified**

Modeling Hadronization Using ML and the Lund String Model

Tuesday, 11 October 2022 10:25 (20 minutes)

Presenter: MENZO, Tony (U. Cincinnati)

Session Classification: Experiment/Theory Connections

Contribution ID: **8**   Type: **not specified**

Modeling Hadronization Using ML and the Cluster Model

Tuesday, 11 October 2022 10:50 (20 minutes)

Presenter: ANDZREJ, Siodmok (Jagiellonian U.)

Session Classification: Experiment/Theory Connections

Contribution ID: **9** Type: **not specified**

A(I)DAPT

Tuesday, 11 October 2022 11:30 (20 minutes)

Presenter: HILLER BLIN, Astrid (Thomas Jefferson National Accelerator Facility)

Session Classification: Experiment/Theory Connections

Contribution ID: **10**   Type: **not specified**

Femtoscale Imaging of Nuclei using ML and Exascale Platforms

Tuesday, 11 October 2022 11:55 (20 minutes)

Presenter: SATO, nobuo (Jefferson Lab)

Session Classification: Experiment/Theory Connections

Contribution ID: **11** Type: **not specified**

Differentiable Simulations

Tuesday, 11 October 2022 12:20 (20 minutes)

Presenter: NACHMAN, Benjamin

Session Classification: Experiment/Theory Connections

Contribution ID: **12**

Type: **not specified**

Discussion

Tuesday, 11 October 2022 12:45 (15 minutes)

Session Classification: Experiment/Theory Connections

Contribution ID: **13**   Type: **not specified**

Reconstructing DIS and SIDIS properties

Tuesday, 11 October 2022 14:50 (20 minutes)

Presenter: PECAR, Connor (Duke University)

Session Classification: Experiment/Theory Connections

Contribution ID: **14**   Type: **not specified**

Machine Learning in Spectroscopy and Partial Wave Analysis

Tuesday, 11 October 2022 14:25 (20 minutes)

Presenter: PHELPS, William (Christopher Newport University/Jefferson Lab)

Session Classification: Experiment/Theory Connections

Contribution ID: **15**   Type: **not specified**

Fast Detector Simulations with Machine Learning

Tuesday, 11 October 2022 14:00 (20 minutes)

Presenter: SHIH, David (Rutgers)

Session Classification: Experiment/Theory Connections

Contribution ID: **16**

Type: **not specified**

overview talk on ML-based unfolding

Tuesday, 11 October 2022 15:35 (20 minutes)

Presenter: BUTTER, Anja (Heidelberg U.)

Session Classification: Experiment/Theory Connections

Contribution ID: **17**   Type: **not specified**

Tutorial on Unfolding

Tuesday, 11 October 2022 16:00 (45 minutes)

Presenters: TORALES - ACOSTA, Fernando; MIKUNI, Vinicius (Other@lbl.gov;Staff@lbl.gov;Member@lbl.gov)

Session Classification: Experiment/Theory Connections

Contribution ID: 18   Type: **not specified**

Interpretable Networks for Identifying Leptons

Wednesday, 12 October 2022 10:00 (25 minutes)

Presenter: WHITESON, Daniel (UC Irvine)

Session Classification: Reconstruction and Particle Identification

Contribution ID: 19   Type: **not specified**

Machine Learning in ACTS

Wednesday, 12 October 2022 11:28 (17 minutes)

Presenter: ALLAIRE, Corentin (IJCLAB)

Session Classification: Reconstruction and Particle Identification

Contribution ID: **20**   Type: **not specified**

Muon Identification with Deep Learning at EIC

Wednesday, 12 October 2022 11:00 (15 minutes)

Presenter: PHELPS, William (Christopher Newport University/Jefferson Lab)

Session Classification: Reconstruction and Particle Identification

Contribution ID: **21** · Type: **not specified**

ML particle identification with measured shower profiles from calorimetry

Wednesday, 12 October 2022 11:48 (15 minutes)

Presenter: PENG, Chao (Argonne National Laboratory)

Session Classification: Reconstruction and Particle Identification

Contribution ID: **22**
Type: **not specified**

Lambda event tagging at CLAS12

Wednesday, 12 October 2022 12:06 (15 minutes)

Presenter: MCENEANEY, Matthew (Duke)

Session Classification: Reconstruction and Particle Identification

Contribution ID: **23**   Type: **not specified**

Tagging heavy flavor jets @ RHIC

Wednesday, 12 October 2022 10:30 (25 minutes)

Presenter: KUNNAWALKAM ELAYAVALLI, Raghav (Vanderbilt University)

Session Classification: Reconstruction and Particle Identification

Contribution ID: **24**　　　　　　　　　　　　　　　　　　Type: **not specified**

Tutorial on MLFlow

Wednesday, 12 October 2022 14:00 (45 minutes)

Presenter: RAJPUT, Kishansingh (Jefferson Lab)

Session Classification: Infrastructure and Frontiers

Contribution ID: **25**   Type: **not specified**

Foundation Model Infrastructure

Wednesday, 12 October 2022 15:00 (13 minutes)

Presenter: VOLKOVA, Svitlana

Session Classification: Infrastructure and Frontiers

Contribution ID: **26**
Type: **not specified**

AI/ML hardware co-design

Wednesday, 12 October 2022 15:18 (13 minutes)

Presenter: LIU, Frank (ORNL)

Session Classification: Infrastructure and Frontiers

Contribution ID: **27** Type: **not specified**

Machine Learning with FPGA

Wednesday, 12 October 2022 15:35 (13 minutes)

Presenter: TRAN, Nhan (Fermilab)

Session Classification: Infrastructure and Frontiers

Contribution ID: **28**   Type: **not specified**

AI/Ml with HPC

Wednesday, 12 October 2022 15:52 (13 minutes)

Presenter: BALINT, Joo (ORNL)

Session Classification: Infrastructure and Frontiers

Contribution ID: **29**
Type: **not specified**

Panel Discussion

Wednesday, 12 October 2022 16:15 (45 minutes)

Presenters: HUANG, Jin (Brookhaven National Lab); WILLIAMS, Mike (MIT); MICELI, Tia (Fermilab)

Session Classification: Infrastructure and Frontiers

Contribution ID: **30** Type: **not specified**

INDRA-ASTRA

Thursday, 13 October 2022 10:00 (20 minutes)

Presenter: DIEFENTHALER, Markus (Jefferson Lab)

Session Classification: Streaming

Contribution ID: **31**   Type: **not specified**

Fast ML for FPGA

Thursday, 13 October 2022 10:22 (20 minutes)

Presenter: FURLETOV, Sergey (JLab)

Session Classification: Streaming

Contribution ID: **32**　　　　　　　　　　　　　　　　　　　Type: **not specified**

AI for streaming readout: an architectural perspective

Thursday, 13 October 2022 10:44 (20 minutes)

Presenter:　AMMENDOLA, Roberto (INFN/Roma2)

Session Classification:　Streaming

Contribution ID: **33**   Type: **not specified**

AI-based data reduction for streaming DAQ

Thursday, 13 October 2022 11:16 (20 minutes)

Presenter: HUANG, Jin (Brookhaven National Lab)

Session Classification: Streaming

Contribution ID: **34**   Type: **not specified**

Streaming Readout for Next Generation Electron Scattering Experiments

Thursday, 13 October 2022 11:38 (20 minutes)

Presenter: BONDI, Mariangela (INFN/Catania)

Session Classification: Streaming

Contribution ID: **35** Type: **not specified**

ML for Heavy Flavor Identification

Thursday, 13 October 2022 12:00 (20 minutes)

Presenter: DEAN, Cameron (MIT)

Session Classification: Streaming

Contribution ID: **36**   Type: **not specified**

AI for Experimental Controls

Thursday, 13 October 2022 12:22 (20 minutes)

Presenter: BRITTON, Thomas (JLAB)

Session Classification: Streaming

Contribution ID: **37**   Type: **not specified**

Tutorial on Graph Neural Networks

Thursday, 13 October 2022 14:00 (45 minutes)

Presenter: REN, Yihui (BNL)

Session Classification: Summary and Future

Contribution ID: **38**

Type: **not specified**

Hackathon on October 14

Thursday, 13 October 2022 14:50 (25 minutes)

Session Classification: Summary and Future

Contribution ID: **39**   Type: **not specified**

Summaries

Thursday, 13 October 2022 15:30 (42 minutes)

Session Classification: Summary and Future

Contribution ID: **40**   Type: **not specified**

Future

Thursday, 13 October 2022 16:15 (15 minutes)

Presenter: FANELLI, Cristiano (W&M)

Session Classification: Summary and Future

Contribution ID: **41**
Type: **not specified**

DOE perspective on opportunities for AI in nuclear physics

Monday, 10 October 2022 11:40 (30 minutes)

Presenter: FARKHONDEH, Manouchehr (US Department of Energy, Office of Nuclear Physics)

Session Classification: Opportunities for AI in NP and EIC

Contribution ID: **42**   Type: **not specified**

NSF perspective on opportunities for AI in nuclear physics

Monday, 10 October 2022 13:30 (30 minutes)

Presenter: MIHAILA, Bogdan (National Science Foundation)

Session Classification: Opportunities for AI in NP and EIC

Contribution ID: **43**　　　　　　　　　　　　　　　　　　Type: **not specified**

ML for calorimetry

Wednesday, 12 October 2022 12:24 (15 minutes)

Presenter:　BRANSON, Nathan (Messiah U.)

Session Classification:　Reconstruction and Particle Identification

Contribution ID: 44 Type: **not specified**

Data-driven learning: Flux+Mutability

Wednesday, 12 October 2022 12:42 (15 minutes)

Presenter: GIROUX, James (U. Regina)

Session Classification: Reconstruction and Particle Identification

Contribution ID: **45**

Type: **not specified**

EIC schedule and overview

Monday, 10 October 2022 10:25 (40 minutes)

Presenters: ASCHENAUER, Elke-Caroline (BNL); ENT, Rolf (Jefferson Lab)

Session Classification: Overview