

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, October 10, 2022 2:00 PM (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, October 10, 2022 2:55 PM (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, October 10, 2022 4:00 PM (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, October 10, 2022 4:25 PM (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, October 10, 2022 3:20 PM (20 minutes)

Presenter: NACHMAN, Benjamin

Session Classification: AI/ML for Design

Contribution ID: 6

Type: **not specified**

ML for QCD Analysis - 3D Imaging

Tuesday, October 11, 2022 10:00 AM (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, October 11, 2022 10:25 AM (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, October 11, 2022 10:50 AM (20 minutes)

Presenter: ANDZREJ, Siodmok (Jagiellonian U.)

Session Classification: Experiment/Theory Connections

Contribution ID: 9

Type: **not specified**

A(I)DAPT

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

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

Session Classification: Experiment/Theory Connections

Contribution ID: **10**

Type: **not specified**

Femtосcale Imaging of Nuclei using ML and Exascale Platforms

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

Presenter: SATO, nobuo (Jefferson Lab)

Session Classification: Experiment/Theory Connections

Contribution ID: 11

Type: **not specified**

Differentiable Simulations

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

Presenter: NACHMAN, Benjamin

Session Classification: Experiment/Theory Connections

Contribution ID: 12

Type: **not specified**

Discussion

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

Session Classification: Experiment/Theory Connections

Contribution ID: 13

Type: **not specified**

Reconstructing DIS and SIDIS properties

Tuesday, October 11, 2022 2:50 PM (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, October 11, 2022 2:25 PM (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, October 11, 2022 2:00 PM (20 minutes)

Presenter: SHIH, David (Rutgers)

Session Classification: Experiment/Theory Connections

Contribution ID: 16

Type: **not specified**

overview talk on ML-based unfolding

Tuesday, October 11, 2022 3:35 PM (20 minutes)

Presenter: BUTTER, Anja (Heidelberg U.)

Session Classification: Experiment/Theory Connections

Contribution ID: 17

Type: **not specified**

Tutorial on Unfolding

Tuesday, October 11, 2022 4:00 PM (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, October 12, 2022 10:00 AM (25 minutes)

Presenter: WHITESON, Daniel (UC Irvine)

Session Classification: Reconstruction and Particle Identification

Contribution ID: 19

Type: **not specified**

Machine Learning in ACTS

Wednesday, October 12, 2022 11:28 AM (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, October 12, 2022 11:00 AM (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, October 12, 2022 11:48 AM (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, October 12, 2022 12:06 PM (15 minutes)

Presenter: MCENEANEY, Matthew (Duke)

Session Classification: Reconstruction and Particle Identification

Contribution ID: 23

Type: **not specified**

Tagging heavy flavor jets @ RHIC

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

Presenter: KUNNAWALKAM ELAYAVALLI, Raghav (Vanderbilt University)

Session Classification: Reconstruction and Particle Identification

Contribution ID: 24

Type: **not specified**

Tutorial on MLFlow

Wednesday, October 12, 2022 2:00 PM (45 minutes)

Presenter: RAJPUT, Kishansingh (Jefferson Lab)

Session Classification: Infrastructure and Frontiers

Contribution ID: 25

Type: **not specified**

Foundation Model Infrastructure

Wednesday, October 12, 2022 3:00 PM (13 minutes)

Presenter: VOLKOVA, Svitlana

Session Classification: Infrastructure and Frontiers

Contribution ID: 26

Type: **not specified**

AI/ML hardware co-design

Wednesday, October 12, 2022 3:18 PM (13 minutes)

Presenter: LIU, Frank (ORNL)

Session Classification: Infrastructure and Frontiers

Contribution ID: 27

Type: **not specified**

Machine Learning with FPGA

Wednesday, October 12, 2022 3:35 PM (13 minutes)

Presenter: TRAN, Nhan (Fermilab)

Session Classification: Infrastructure and Frontiers

Contribution ID: 28

Type: **not specified**

AI/ML with HPC

Wednesday, October 12, 2022 3:52 PM (13 minutes)

Presenter: BALINT, Joo (ORNL)

Session Classification: Infrastructure and Frontiers

Contribution ID: 29

Type: **not specified**

Panel Discussion

Wednesday, October 12, 2022 4:15 PM (45 minutes)

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

Session Classification: Infrastructure and Frontiers

Contribution ID: **30**

Type: **not specified**

INDRA-ASTRA

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

Presenter: DIEFENTHALER, Markus (Jefferson Lab)

Session Classification: Streaming

Contribution ID: 31

Type: **not specified**

Fast ML for FPGA

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

Presenter: FURLETOV, Sergey (JLab)

Session Classification: Streaming

Contribution ID: 32

Type: **not specified**

AI for streaming readout: an architectural perspective

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

Presenter: AMMENDOLA, Roberto (INFN/Roma2)

Session Classification: Streaming

Contribution ID: 33

Type: **not specified**

AI-based data reduction for streaming DAQ

Thursday, October 13, 2022 11:16 AM (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, October 13, 2022 11:38 AM (20 minutes)

Presenter: BONDI, Mariangela (INFN/Catania)

Session Classification: Streaming

Contribution ID: 35

Type: **not specified**

ML for Heavy Flavor Identification

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

Presenter: DEAN, Cameron (MIT)

Session Classification: Streaming

Contribution ID: 36

Type: **not specified**

AI for Experimental Controls

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

Presenter: BRITTON, Thomas (JLAB)

Session Classification: Streaming

Contribution ID: 37

Type: **not specified**

Tutorial on Graph Neural Networks

Thursday, October 13, 2022 2:00 PM (45 minutes)

Presenter: REN, Yihui (BNL)

Session Classification: Summary and Future

Contribution ID: **38**

Type: **not specified**

Hackathon on October 14

Thursday, October 13, 2022 2:50 PM (25 minutes)

Session Classification: Summary and Future

Contribution ID: 39

Type: **not specified**

Summaries

Thursday, October 13, 2022 3:30 PM (42 minutes)

Session Classification: Summary and Future

Contribution ID: 40

Type: **not specified**

Future

Thursday, October 13, 2022 4:15 PM (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, October 10, 2022 11:40 AM (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, October 10, 2022 1:30 PM (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, October 12, 2022 12:24 PM (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, October 12, 2022 12:42 PM (15 minutes)

Presenter: GIROUX, James (U. Regina)

Session Classification: Reconstruction and Particle Identification

Contribution ID: 45

Type: **not specified**

EIC schedule and overview

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

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

Session Classification: Overview