Preliminary Program

Week of: November 1

11/1/2022 TUESDAY

- Registration - 45 min
- Tutorials
  - Prep and Instructions
  - (45 min) Tutorial on Bayesian Optimization, Ryan Roussel , SLAC
  - Break - 20 min
  - (45 min) Tutorial on Anomaly Detection, Antonin Sulc , DESY
  - Break - 20 min
  - (45 min) Tutorial on Reinforcement Learning, Kishansingh Rajput , Jlab
  - Lunch - 1 1/2 hr
  - (45 min) AFCL - HPC for AI/ML, Speaker TBA , ANL
  - (45 min) Tutorial on Uncertainty Quantification, Natalie Isenberg , BNL
  - Break - 20 min
  - Collaborations
    - (60 min) Online Optimizations
      - (10 min) Xopt, Ryan Roussel , SLAC
      - (10 min) Badger, Zhe Zhang , SLAC
      - (10 min) GeOFF and COI, Nico Madysa , CERN
      - (10 min) RadiaSoft Tools, RadiaSoft Team , RadiaSoft
      - (20 min) Open Discussion
  - Break - 20 min
    - (60 min) Online Models
      - (10 min) Xopt, Ryan Roussel , SLAC
      - (10 min) Badger, Zhe Zhang , SLAC
      - (10 min) GeOFF and COI, Nico Madysa , CERN
      - (10 min) RadiaSoft Tools, RadiaSoft Team , RadiaSoft
      - (20 min) Open Discussion
- Social Event: Meet & Greet - 2 hrs

11/2 WEDNESDAY

- Registration - 30 min
- WELCOME SESSION
- Bayesian Optimization
  - 3 [25 min] Bayesian Algorithm Execution for Tuning Particle Accelerator Emittance with Partial Measurements, Sara Miskovich , SLAC
  - 2 [25 min] Machine Learning Tools to support the ATLAS Ion Linac Operations at Argonne, Jose L. Martinez-Marin , ANL
  - 1 [25 min] Bayesian optimization for trajectory alignment at LEReC, Yuan Gao , BNL
- Break - 30 min
- Reinforcement Learning
  - 1 [25 min] MACHINE LEARNING FOR SLOW SPILL REGULATION IN THE FERMILAB DELIVERY RING, Mattson Thieme , NorthWestern University
  - 2 [25 min] Reinforcement Learning Applied to Optimization of LHC Beams in the CERN Proton Synchrotron, Joel Axel Wulff , CERN
  - 3 [25 min] A Closer Look at Reinforcement Learning for Beam-Based Feedback Systems, Dr. Leander Grech , Univ. Malta
- Lunch - 1 1/2 hr
- Prognostics
  - 1 [25 min] SRF Cavity Fault Classification and Prediction at Jefferson Lab, Chris Tennant , JLab
  - 2 [25 min] Beam-based RF Station Fault Identification at the Linac Coherent Light Source, Ryan Humble , Stanford
  - 3 [25 min] Status of Data-Driven Beam Trajectory Anomaly Detection, Antonin Sulc , DESY
  - 4 [25 min] Disentangling Beam Losses In The Fermilab Main Injector Enclosure Using Real-time Edge AI, Kyle Hazelwood , FNAL
  - 5 [25 min] Uncertainty Aware Anomaly Detection to Predict Errant Beam Pulses and GradCAM Analysis, Kishansingh Rajput , JLab
- Break - 30 min
- Poster Session - 1 1/2 hrs

11/3 THURSDAY

- Modeling
  - 1 [25 min] Data-driven Chaos Indicator for Nonlinear Dynamics and Applications on Storage Ring Lattice Design, Robert Rainer , BNL
  - 3 [25 min] Towards End-to-End Differentiable Accelerator Modeling, Juan Pablo Gonzalez-Aguilera , Univ. Chicago
  - 4 [25 min] Experience with Integrated Systems for Online Physics Modeling, Adaptive ML Modeling, and Model-Based Control, Auralee Edelen , SLAC
  - 2 [25 min] Luminosity tuning for future Electron-Ion Collider, Derong Xu , BNL
- Break - 30 min
- Facility
  - 1 [25 min] Application of Natural Language Processing on Electronic Logbooks, Jennefer Maldonado , BNL
  - 2 [25 min] Towards (more) autonomous accelerators - status and vision at CERN, Verena Kain , CERN
  - 3 [25 min] How to get ML into the control room - the CERN ML frameworks, Nico Madysa , CERN
- Lunch - 1 1/2 hr
  - 4 [25 min] Data Analysis and Control of an MeV Ultrafast Electron Diffraction System Using Machine Learning, Trudy Bolin , UNM
- Optimization
  - 1 [25 min] Machine learning for tuning, prediction, and control at the KIT electron accelerators, Andrea Santamaria Garcia , KIT
  - 2 [25 min] Towards Linac RF Optimization with Machine Learning, Ralitsa Sharankova , FNAL
  - 3 [25 min] ID orbit compensation with neural networks for PETRA III, Bianca Veglia , DESY
  - 4 [25 min] Recent progress on ML-based optimization and anomaly prediction at APS, Nikita Kuklev , ANL
- Analysis
  - 1 [25 min] Phase Space Reconstruction from Accelerator Beam Measurements Using Neural Networks and Differentiable Simulations, Ryan Roussel , SLAC
  - 2 [25 min] Improving neural networks predictions using physics - PINN for the CERN accelerators, Francesco Maria Velotti , CERN
  - 3 [25 min] Transverse 2D phase-space tomography using BPMs, Kilean Hwang , FRIB
  - 4 [25 min] Simulation Studies and Machine Learning Applications for Orbit Correction at the Alternating Gradient Synchrotron, Weijian Lin , Cornell
- (20 min) RadiaSoft Tools, RadiaSoft Team , RadiaSoft

11/4 FRIDAY

- Summaries
  - Modeling & Analysis Summary, Chris Tennant (15 min), Raimund Kammering (15 min)
  - Optimizations Summary, Hirokazu Maesaka (15 min), Christrine Sweeney (15 min), Andrea Santamaria Garcia (15 min)
  - Facility & Prognostics Summary, Francesco Maria Velotti (15 min), Verena Kain (15 min)
- Future Workshops, Daniel Ratner, SLAC
- Concluding Remarks, Sandra Biedron & Kevin Brown
- Lunch
- Tour - FNAL

11/5 SATURDAY