

# **Machine Learning Applications for Particle Accelerators**

## **Report of Contributions**

Contribution ID: 0

Type: **not specified**

# Welcome

*Wednesday, 28 February 2018 09:00 (20 minutes)*

**Presenter:** Prof. RAUBENHEIMER, Tor (SLAC)

Contribution ID: 1

Type: **not specified**

# **Facility needs: Hadron Synchrotrons: Operational challenges at the LHC**

*Wednesday, 28 February 2018 09:20 (20 minutes)*

**Presenter:** FUCHSBERGER, Kajetan (CERN)

**Session Classification:** Facility needs

Contribution ID: 2

Type: **not specified**

## Facility needs: XFELs

*Wednesday, 28 February 2018 09:40 (20 minutes)*

**Presenter:** KAMMERING, Raimund (DESY)

**Session Classification:** Facility needs

Contribution ID: 3

Type: **not specified**

## Facility needs: Synchrotrons

*Wednesday, 28 February 2018 10:00 (20 minutes)*

**Presenter:** HUANG, Xiaobiao

**Session Classification:** Facility needs

Contribution ID: 4

Type: **not specified**

## **Fault detection and alarm systems for the CERN Technical Infrastructure**

*Wednesday, 28 February 2018 10:50 (20 minutes)*

**Presenter:** NIELSEN, Jesper (CERN)

**Session Classification:** Facility needs

Contribution ID: 5

Type: **not specified**

## Facility needs - or chances - seen from the other side

*Wednesday, 28 February 2018 11:10 (20 minutes)*

**Presenter:** CANDEL, Arno

**Session Classification:** Facility needs

Contribution ID: 6

Type: **not specified**

## Discussion

*Wednesday, 28 February 2018 11:30 (30 minutes)*

**Presenter:** LI, Kevin

**Session Classification:** Facility needs



Contribution ID: 7

Type: **not specified**

## Experience with FEL taper tuning using reinforcement learning and clustering

*Wednesday, 28 February 2018 13:00 (20 minutes)*

**Presenter:** Dr WU, Juhao

**Session Classification:** Tuning

Contribution ID: 8

Type: **not specified**

# Introduction to Bayesian Optimization

*Wednesday, 28 February 2018 13:20 (20 minutes)*

**Presenter:** KIRSCHNER, Johannes

**Session Classification:** Tuning

Contribution ID: 9

Type: **not specified**

## **Experience at SLAC with Bayesian Optimization using Gaussian Processes**

*Wednesday, 28 February 2018 13:40 (20 minutes)*

**Presenter:** DURIS, Jopseph

**Session Classification:** Tuning

Contribution ID: **10**

Type: **not specified**

## **ML Tuning discussion**

Contribution ID: **11**

Type: **not specified**

## Poster Blitz

*Wednesday, 28 February 2018 14:00 (20 minutes)*

**Session Classification:** Tuning

Contribution ID: 12

Type: **not specified**

## **General experience with online optimization**

*Wednesday, 28 February 2018 16:00 (20 minutes)*

**Presenters:** SCHEINKER, Alexander; ALEX, Scheinker

**Session Classification:** Tuning

Contribution ID: 13

Type: **not specified**

# **Sloppy and Genetic Algorithms for Low-Emittance Tuning at CESR**

*Wednesday, 28 February 2018 16:20 (20 minutes)*

**Presenter:** BAZAROV, Ivan

**Session Classification:** Tuning

Contribution ID: 14

Type: **not specified**

## Discussion: Tuning

*Wednesday, 28 February 2018 16:40 (40 minutes)*

**Presenter:** EDELEN, Auralee (CSU)

**Session Classification:** Tuning



Contribution ID: 15

Type: **not specified**

## Experience with tuning at XFEL

*Wednesday, 28 February 2018 15:20 (20 minutes)*

**Presenter:** TOMIN, Sergey

**Session Classification:** Tuning

Contribution ID: 16

Type: **not specified**

## **Experience with Model Predictive Control and Model-based Reinforcement Learning using Neural Networks**

*Thursday, 1 March 2018 09:00 (20 minutes)*

**Presenter:** EDELEN, Auralee

**Session Classification:** Simulations and Modeling

Contribution ID: 17

Type: **not specified**

## **Forecasting of Beam Interlocks in High Intensity (Hadron) Accelerators**

*Thursday, 1 March 2018 09:20 (20 minutes)*

**Presenter:** ADELMANN, Andreas

**Session Classification:** Simulations and Modeling

Contribution ID: **18**

Type: **not specified**

## Light Source Simulations

*Thursday, 1 March 2018 09:40 (20 minutes)*

**Presenter:** AGAPOV, Ilya (DESY)

**Session Classification:** Simulations and Modeling

Contribution ID: 19

Type: **not specified**

# Neural Network Modeling and Virtual Diagnostics at FAST

*Thursday, 1 March 2018 11:00 (20 minutes)*

**Presenter:** EDELEN, Jonathan

**Session Classification:** Simulations and Modeling

Contribution ID: 20

Type: **not specified**

## GANs for Simulation in HEP

*Thursday, 1 March 2018 11:20 (20 minutes)*

**Presenter:** DE OLIVEIRA, Luke

**Session Classification:** Simulations and Modeling

Contribution ID: **21**

Type: **not specified**

## Discussion

*Thursday, 1 March 2018 11:40 (20 minutes)*

**Presenter:** AGAPOV, Ilya (DESY)

**Session Classification:** Simulations and Modeling

Contribution ID: 22

Type: **not specified**

## **Machine learning for anomaly detection in large distributed accelerator systems**

*Thursday, 1 March 2018 13:00 (20 minutes)*

**Presenter:** VAN TRAPPEN, Pieter

**Session Classification:** Prognosics



Contribution ID: 23

Type: **not specified**

## Beam loss plane recognition for the LHC

*Thursday, 1 March 2018 13:20 (20 minutes)*

**Presenter:** VALENTINO, Gianluca

**Session Classification:** Prognosics

Contribution ID: 24

Type: **not specified**

## Detection of bad BPMs

*Thursday, 1 March 2018 13:40 (20 minutes)*

**Presenter:** FOL, Elena

**Session Classification:** Prognosics

Contribution ID: 25

Type: **not specified**

## Discussion

*Thursday, 1 March 2018 14:00 (30 minutes)*

**Session Classification:** Prognosics

Contribution ID: 26

Type: **not specified**

# **Machine learning application on the investigation of the micro-bunching instability at storage rings**

*Friday, 2 March 2018 09:00 (20 minutes)*

**Presenter:** Mr BOLTZ, Tobias (KIT)

**Session Classification:** Data Analysis

Contribution ID: 27

Type: **not specified**

## **Non-parametric Density Estimators for the Measurements of Ionization Cooling**

*Friday, 2 March 2018 09:20 (20 minutes)*

**Presenter:** MOHAYAI, Tanaz Angelina (Illinois Institute of Technology)

**Session Classification:** Data Analysis

Contribution ID: 28

Type: **not specified**

## Data mining at HIPA

*Friday, 2 March 2018 09:40 (20 minutes)*

**Presenter:** Mr SNUVERINK, Jochem (Paul Scherrer Institute)

**Session Classification:** Data Analysis

Contribution ID: 29

Type: **not specified**

## Summary

*Friday, 2 March 2018 11:00 (1 hour)*

**Presenters:** EDELEN, Auralee (CSU); BOWRING, Daniel (Fermilab); AGAPOV, Ilya (DESY); LI, Kevin (CERN); Dr ISCHEBECK, Rasmus (PSI)

Contribution ID: **30**

Type: **not specified**

# Whitepaper and Collaboration planning

*Friday, 2 March 2018 13:30 (1h 30m)*

**Presenter:** Dr MAYES, Christopher (SLAC National Accelerator Laboratory)



Contribution ID: 31

Type: **not specified**

## Experience with tuning at FERMI@Elettra

*Wednesday, 28 February 2018 15:40 (20 minutes)*

**Presenter:** GAIO, Giulio (FERMI@Elettra)

**Session Classification:** Tuning

Contribution ID: 32

Type: **not specified**

## Logistic Regression, Neural Networks

*Tuesday, 27 February 2018 09:00 (1h 30m)*

**Session Classification:** ML Tutorial

Contribution ID: 33

Type: **not specified**

## Unsupervised Learning (Clustering), Toy Optics model

*Tuesday, 27 February 2018 13:00 (1h 30m)*

**Session Classification:** ML Tutorial

Contribution ID: 34

Type: **not specified**

## Neural Networks

*Tuesday, 27 February 2018 11:00 (1 hour)*

**Session Classification:** ML Tutorial