

Thrill WP5 ML Workshop

Report of Contributions

Contribution ID: **1** Contribution code: **03**

Type: **not specified**

High energy lasers & AI

Tuesday 27 February 2024 14:15 (20 minutes)

Presenters: MEIGNIEN, Loïc (CNRS-LULI); AUDEBERT, Patrick (Ecole Polytechnique)

Session Classification: Data

Contribution ID: 2 Contribution code: 04

Type: **not specified**

What it really means to support a (cross-continental) ML optimization loop for a user

Tuesday 27 February 2024 14:45 (20 minutes)

Presenter: PLOETZENEDER, Birgit (ELI Beamlines)

Session Classification: Data

Contribution ID: 3 Contribution code: 06

Type: **not specified**

System Data Acquisition & Management at PHELIX

Tuesday 27 February 2024 15:30 (20 minutes)

Presenter: OHLAND, Jonas Benjamin (GSI)

Session Classification: Data

Contribution ID: 4 Contribution code: 08

Type: **not specified**

The Draco laser and it's data for ML / AI

Tuesday 27 February 2024 16:45 (20 minutes)

Presenter: BOCK, Stefan (HZDR)

Session Classification: Data

Contribution ID: 5 Contribution code: 13

Type: **not specified**

Defining a Laser Data Exchange Format: HELPMI

Wednesday 28 February 2024 10:10 (20 minutes)

Presenter: SCHLENVOIGT, Hans-Peter (HZDR)

Session Classification: Data

Contribution ID: 6 Contribution code: 14

Type: **not specified**

Implementing Data Acquisition and Exchange

Amplitude

Session Classification: Data

Contribution ID: 7 Contribution code: 15

Type: **not specified**

Data Management: Connecting Processes to Data via Meta-Data

Wednesday 28 February 2024 10:40 (20 minutes)

Presenter: KNODEL, Oliver (Helmholtz-Zentrum Dresden-Rossendorf)

Session Classification: Data

Contribution ID: **8** Contribution code: **01**

Type: **not specified**

WP5 Keynote

Tuesday 27 February 2024 13:10 (20 minutes)

Presenter: BAGNOUD, Vincent

Session Classification: General

Contribution ID: **9** Contribution code: **00**

Type: **not specified**

Welcome

Tuesday 27 February 2024 13:00 (10 minutes)

Presenters: KELLING, Jeffrey (HZDR); AUDEBERT, Patrick (Ecole Polytechnique)

Session Classification: General

Contribution ID: **10** Contribution code: **02**

Type: **not specified**

Machine Learning in Laser System Optimization

Tuesday 27 February 2024 13:35 (20 minutes)

Presenter: KELLING, Jeffrey (HZDR)

Session Classification: ML

Contribution ID: 11 Contribution code: 05

Type: **not specified**

Optimization of High-Power Laser Pulse Temporal Shape

Tuesday 27 February 2024 15:10 (10 minutes)

We study the optimization of high-power laser pulse temporal shape to obtain the shortest possible pulse

duration by employing a control feedback loop between a pulse shaper and pulse duration measurements instrument.

Performance of five optimization algorithms were explored - the Differential Evolution algorithm, the Nelder-Mead

algorithm, and three hybridization approaches of Differential Evolution (DE), Bayesian optimization (BO) and Nelder-

Mead (NM) algorithms. The hybrid algorithms perform the exploration with the DE or BO algorithm and the

exploitation with the NM algorithm. Algorithms were tested on a semi-physical model of the actual laser based on

linear and nonlinear phase accumulation. We find that the hybridization of the algorithms yields better overall results.

Presenters: PECELI, Davorin (ELI Beamlines); ANJUM, Ishraq Md (University of Maryland Baltimore County)

Session Classification: Data

Contribution ID: **13** Contribution code: **10**

Type: **not specified**

Predictive Beam Steering and Machine Learning at JETi200

Tuesday 27 February 2024 17:15 (20 minutes)

Presenter: SAEVERT, Alexander (Helmholtz Institut Jena)

Session Classification: Data

Contribution ID: **14** Contribution code: **11**

Type: **not specified**

Challenges arising from System Instability at HIBEF

Wednesday 28 February 2024 09:00 (20 minutes)

Presenter: COWAN, Thomas E. (HZDR)

Session Classification: General

Contribution ID: **15** Contribution code: **12**

Type: **not specified**

Data Acquisition at HIBEF's Relax laser

Wednesday 28 February 2024 09:30 (15 minutes)

Presenter: TONCIAN, Toma (HZDR)

Session Classification: Data

Contribution ID: **16** Contribution code: **07**

Type: **not specified**

Lasers at the Institute of Radiation Physics @ HZDR

Tuesday 27 February 2024 16:15 (20 minutes)

Presenter: SCHRAMM, Ulrich

Session Classification: Data