

Data Science and Machine Learning Workshop Summary

@ICALEPCS2021

Manuel Gonzalez-Berges (CERN)
Marco Lonza (Elettra)

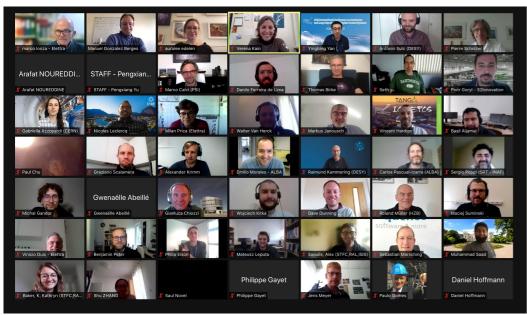


First DS/ML workshop at ICALEPCS2019

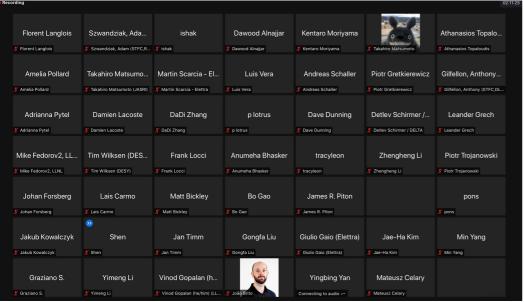




DS/ML Workshop at ICALEPCS2021



						@Paul Smith: hi, anybody had a charg
// Matteo DI Carlo	∦ Qiang Wang		N Paulo Gomes	Daniel Hoffmann M Daniel Hoffmann	Florent Langlois **Florent Langlois**	Szwandziak, Ada // Szwandziak, Adam (STFC,R
ishak ∦ ishak	Dawood Alnajjar	Kentaro Moriyama	// Takahiro Matsumoto	Athanasios Topalo ** Athanasios Topaloudis	Amelia Pollard **M Amelia Pollard	Takahiro Matsumo // Takahiro Matsumoto (JASRI)
Martin Scarcia - El Martin Scarcia - Elettra	Luis Vera	Andreas Schaller Mandreas Schaller	Piotr Gretkierewicz	Gilfellon, Anthony	Adrianna Pytel	Damien Lacoste # Damien Lacoste
DaDi Zhang	p lotrus ∦ p lotrus	Dave Dunning **Market Dunning**	Detlev Schirmer / **Detlev Schirmer / DELTA	Leander Grech	Mike Fedorov2, LL	Tim Wilksen (DES
Frank Locci	Anumeha Bhasker	tracyleon	Zhengheng Li	Piotr Trojanowski	Johan Forsberg	Lais Carmo
Matt Bickley	Bo Gao ∦ ^{Bo Gao}	James R. Piton		pons	Jakub Kowalczyk	Shen
Jan Timm	Gongfa Liu	Giulio Gaio (Elettra)	Jae-Ha Kim	Min Yang	Graziano S.	Yimeng Li



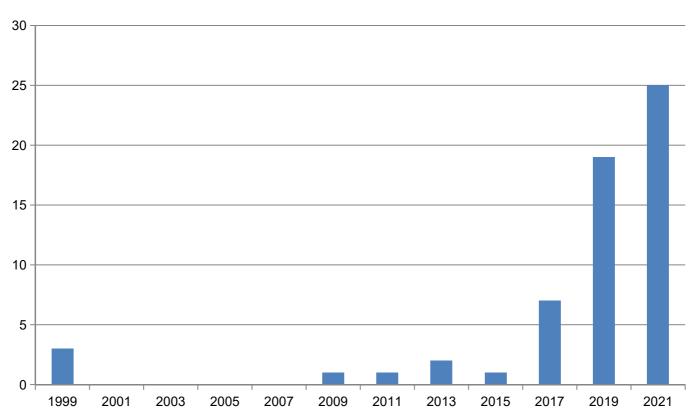




DS & ML at ICALEPCS conferences

Keywords: Expert Systems, Machine Learning, Artificial Intelligence, Artificial Neural Networks, Genetic Algorithms, ...

Number of Papers





Past ICALEPCS tracks with ML papers

- ✓ ICALEPCS 2013 • Knowledge-based Techniques
- ✓ ICALEPCS 2015 Feedback Systems, Tuning
- ✓ ICALEPCS 2017 Feedback
 - (ML mentioned in track descriptions for the first time)
- Feedback Control and Process Tuning
- Data Analytics

- ✓ ICALEPCS 2019 ======
- Data Analytics –
- Feedback Control and Process Tuning
- Experiment Control
- ✓ ICALEPCS 2021 =====
- Data Analytics
- Feedback Control, Machine Tuning & Optimization
- Experiment Control
- Timing Systems, Synchronization & Real-Time Apps



Overview Session



ML and optimisation algorithms for CERN accelerators

Status and Results

V. Kain for the CERN ATS ML community forum

ML and optimisation algorithms for CERN accelerators, 15/10/2021

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Projects Session

LSTM model for the automatic LHC collimator alignment	Gabriella Azzopardi	0
Remote	14:10 - 14:	35
Report on the Artificial Intelligence workshop at EuXFEL	Danilo Ferreira de Lima	0
Remote	14:35 - 14:	50
Automatic Serial Femtosecond Crystallography online analysis with Reinforcement Learning	Danilo Ferreira De Lima	0
Remote	14:50 - 15:	10
Report on LEAPS Integrated Platform workshop	Marco Calvi	0
Remote	15:10 - 15:	30
Machine Learning for the Tune Estimation in the LHC	Leander Grech	0
Remote	15:30 - 15:	50
Peek to some recent ML Activities at DESY	Raimund Kammeri	ing
Remote	15:50 - 16:	.00
Machine Learning for Failure Detection on RF Cavities	Antonin Sulc	0
Remote	16:00 - 16:	10

Submitted Topics & Problems for discussion	
Remote	16:10 - 16:25
Conclusion	
Remote	16:25 - 16:30



Conclusions

- ✓ Topics
 - Large range of problems with practical solutions
 - Systems start to be used in production
 - Bias towards accelerator topics (& Europe)
- ✓ Format
 - Remote format & large audience (challenging organization)
 - No tutorials included
 - Covered by previous workshop + online resources
 - Suggestion to introduce parallel discussions in the future
- ✓ More conference style than actual workshop
 - "Very shy audience"
- ✓ Workshop site: https://indico.cern.ch/event/1075165/

Many thanks to all speakers, attendees & ICALEPCS organizers!!