Data Science and Machine Learning Workshop Summary

@ICALEPCS2021

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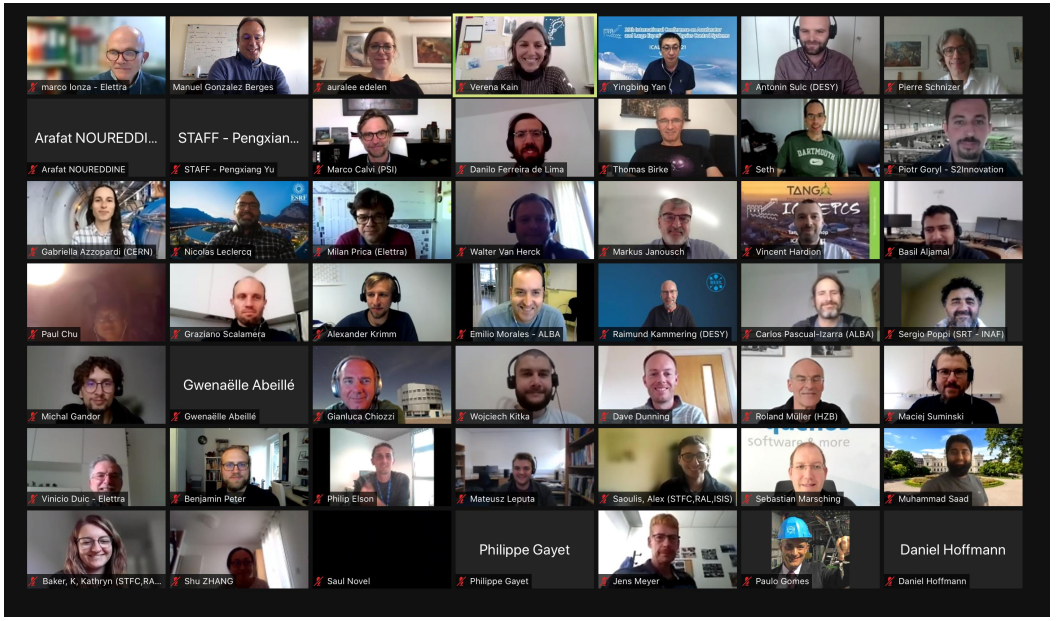
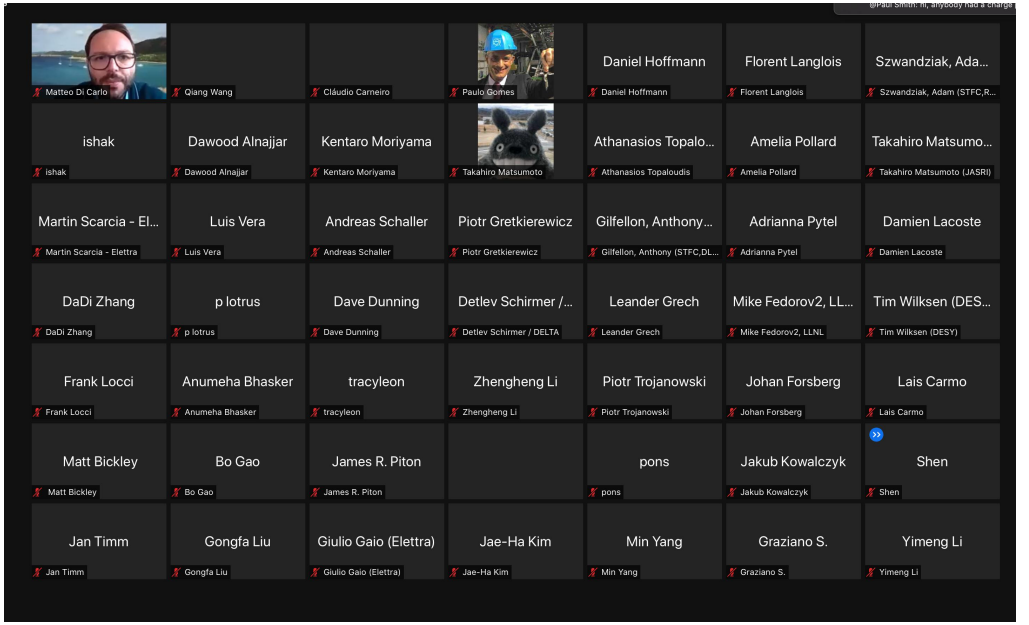
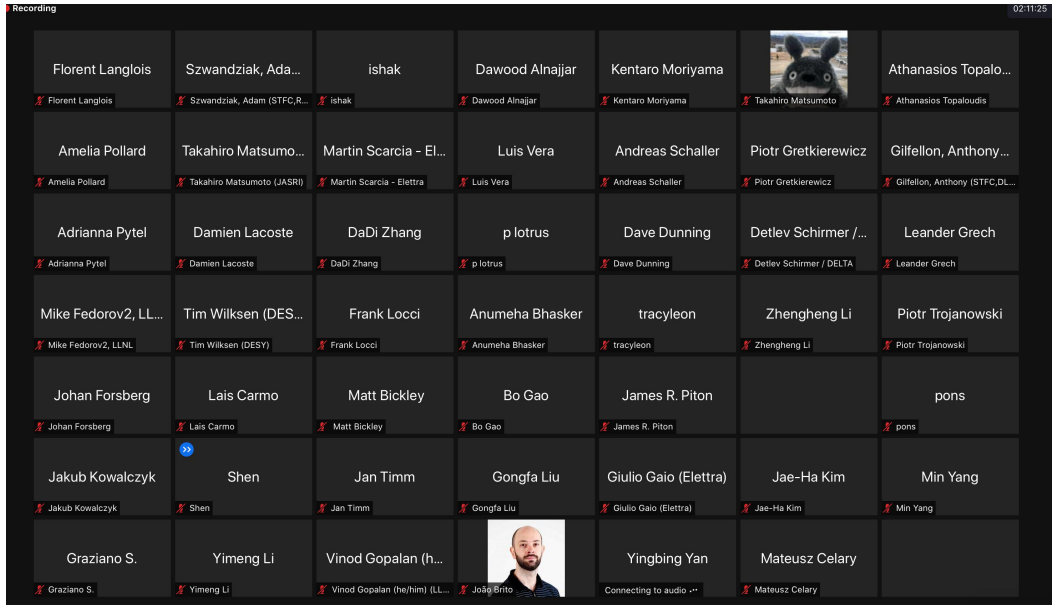
Marco Lonza (Elettra)

First DS/ML workshop at ICALEPCS2019

DS/ML Workshop at ICALEPCS2021



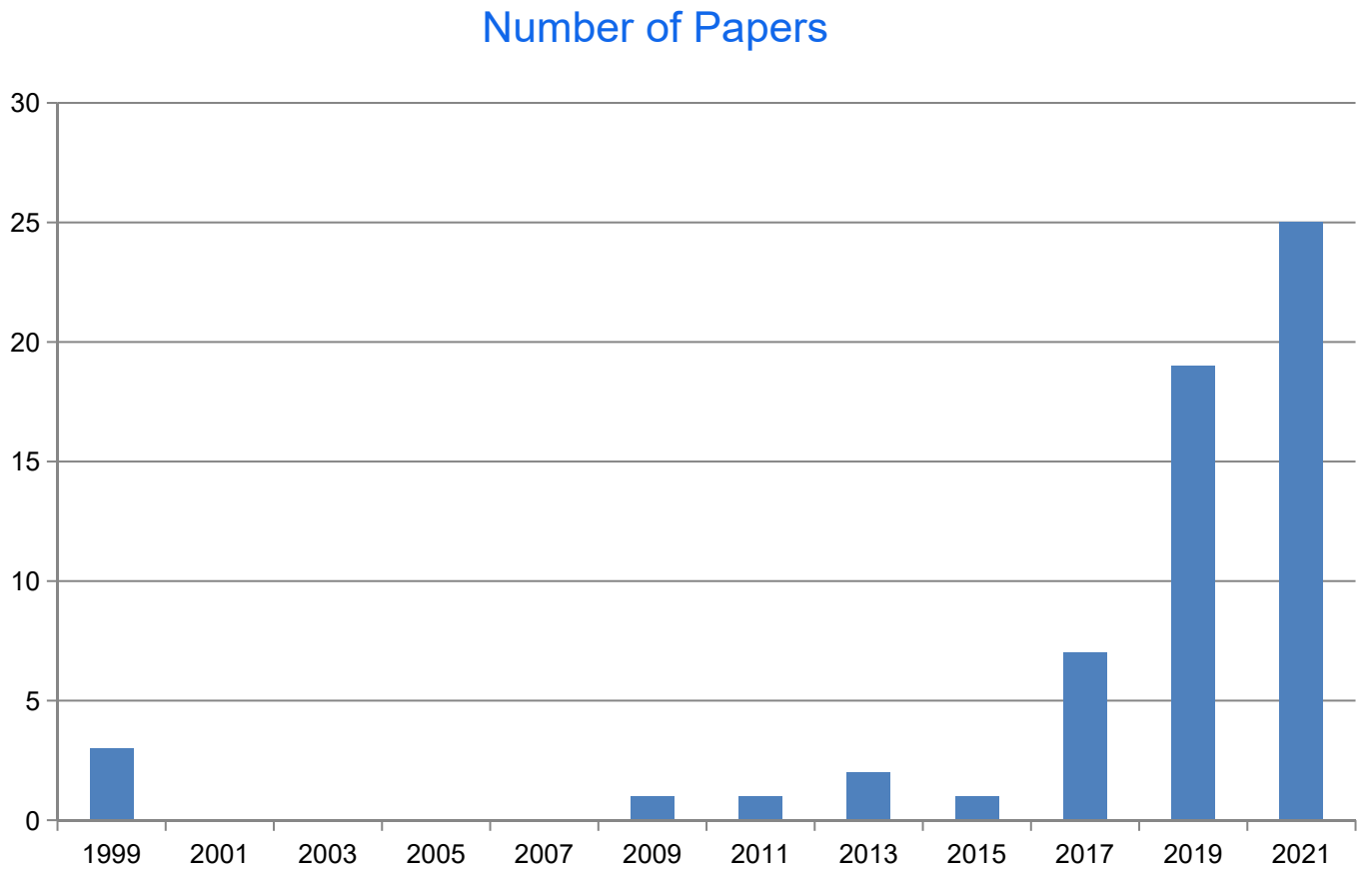




130 attendees
(>200 registered)

DS & ML at ICALEPCS conferences

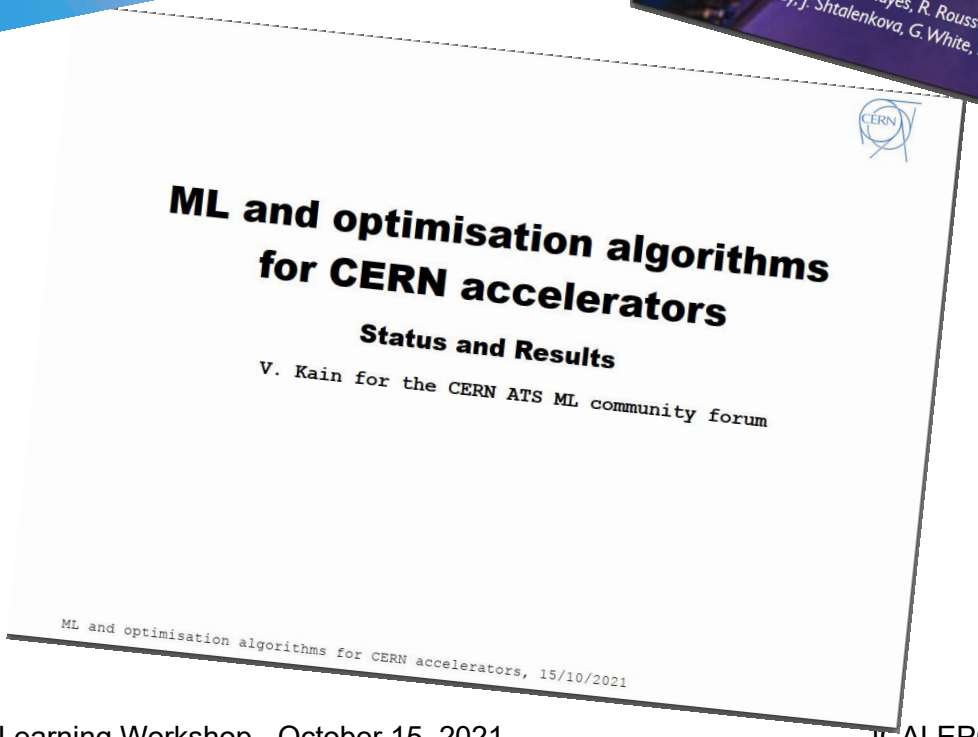
Keywords: *Expert Systems, Machine Learning, Artificial Intelligence, Artificial Neural Networks, Genetic Algorithms, ...*



Past ICALEPCS tracks with ML papers

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



Projects Session

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