

Data Science @ LHC 2015

Bridging High-Energy Physics and Machine Learning communities

9 - 13 November 2015, CERN

Conclusion
David Rousseau
LAL-Orsay
Dubna, 8 December 2015

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- Michelangelo Mangano (CERN)
- Maurizio Pierini (CERN)
- Jean-Roch Vlimant (Caltech)

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<http://cern.ch/DataScienceLHC2015>

Ideas

(From final discussions, and organising committee debrief)

- ❑ Better overall analysis sensitivity by handling systematics already at training stage
- ❑ Apply image pattern recognition algorithms to tracking or fine grained calorimeters
- ❑ Electronic noise rejection using gaussian process models
- ❑ Integrate Matrix Element in a deep learning procedure
- ❑ Feasibility of a deep-learned fast-simulation
- ❑ Use natural language processing help in predicting faults in our systems (daq, production, ...) when parsing the logs.
- ❑ Data Science algorithms for better decyphering of current and planned detector data, OK,
 - → also change design of future experiments ?

Follow up



- ❑ Organising committee will try to write-up something in some form in the next few months (beyond some PR e.g. : <http://www.nature.com/news/artificial-intelligence-called-in-to-tackle-lhc-data-deluge-1.18922>)
- ❑ Consensus this workshop is a first of a series.
 - Current thinking : yearly workshop, but alternate small workshop focussed on a particular issue and general ones
- ❑ Very important to maintain/develop links with professional data scientists
- ❑ Many HEP/data science workshops:
 - This one of course
 - ALEPH (Applying machine Learning to Experimental Physics) Workshop @ NIPS 2015 this week
 - Connecting The Dots (pattern recognition workshop where the tracking challenge emerged in February 2015) Vienna Feb 2016
 - Heavy Flavour Data Mining workshop, Zurich Feb 2016 (LHCb challenge prizes)
- ❑ Google group for any one with an interest in both Data Science and High Energy Physics (mainly for announcements) : HEP-data-science@googlegroups.com