



**Machine**

**Learning**

r

**Sergei**

**Gleyzer**

**Community White Paper (CWP)**

**IML Meeting**

**Oct. 12, 2018**

# Outline



- **Current status**
- **Second edition**
- **Practical**

## Machine Learning in High Energy Physics Community White Paper

July 10, 2018

**Abstract:** Machine learning is an important applied research area in particle physics, beginning with applications to high-level physics analysis in the 1990s and 2000s, followed by an explosion of applications in particle and event identification and reconstruction in the 2010s. In this document we discuss promising future research and development areas in machine learning in particle physics with a roadmap for their implementation, software and hardware resource requirements, collaborative initiatives with the data science community, academia and industry, and training the particle physics community in data science. The main objective of the document is to connect and motivate these areas of research and development with the physics drivers of the High-Luminosity Large Hadron Collider and future neutrino experiments and identify the resource needs for their implementation. Additionally we identify areas where collaboration with external communities will be of great benefit.

**Based on a series of workshops,  
community discussions (2017)**

**IML WS, DS@HEP, S2I2, ACAT**



## **Describes physics drivers for 2020s: R&D areas, ML Tools, Resources, Training and Outreach, Roadmap**

- 1<sup>st</sup> version on arxiv  
<https://arxiv.org/abs/1807.02876>
- 118 authors from HEP community, DS, CS and industry

# What's next



- **Solicit community feedback**
  - Use hypothes.is  
<https://hypothes.is/groups/j9RW8j3i/hep-software-foundation>
  - Comments due by Oct 25
- **Update paper**

Target: Jan 1, 2019

# Types of Comments



- **Author update/modify**
- **Acknowledgements**
- **General:**
  - [Comments Google Doc](#)
- **Remember:** goal is to improve current document (not update with new ideas that appeared since)

# What's next



- **CWP Discussion Meeting:**
  - <https://indico.cern.ch/event/764168/>
  - October 25, 17h CERN time

# Editorial Team



- Sergei Gleyzer (Florida)
- Lorenzo Moneta (CERN)
- Steven Schram (Geneva)
- Paul Seyfert (CERN)
- + editor from intensity frontier (TBC)



# Summary



- CWP version 1 is public
- Solicitation of community comments towards version 2 by end of 2018
- Please take part