

Plans for CompF3 WP:
*Data Science & Machine
Learning Education in HEP*

Mark Neubauer
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[LOIs on this topic](#)

Expansion of HEP-ML Education

[Link](#)

● **Gabriele Benelli¹, Lindsey Gray², Gregor Kasieczka³, Matthias Komm⁴, Mia Liu⁵, Scarlet Norberg⁶, Alexx Perloff⁷, Marcel Rieger⁴, Claire Savard⁷, Savannah Thais⁸, and Jean-Roch Vlimant⁹**

● Supporting Research at the Intersection of
Physics and Machine Learning

Savannah Thais (Princeton University)

[Link](#)

Particle Physics and Machine Learning in Education

● **Mark Neubauer¹**

[Link](#)

Recent Activities & Organization

- Held meeting on Dec 16, 2021
 - A couple of us who were available met before the break to propose a scope for the WP and develop a draft outline based on the LOIs and other discussions.
- [Google Doc](#) (including Overleaf link)
- Snowmass Slack channel [#compF03-ml-wp-education](#)
- The list of authors on the WP is currently the join of the LOI authors, those that participated in the Dec 16 meeting and others that expressed interest
 - If you would like to be added to or removed from the list of authors for contributions, please email me at msn@illinois.edu
- Plan for a next meeting over the next few weeks

WP Outline (initial draft from Google doc)

- **Introduction**
- **Types of education delivery**
 - Undergraduate-level courses in Physics Department
 - Graduate-levels courses in Physics Department
 - “Capstone”/Mentoring projects (e.g. industry connections, interdisciplinary) [SC]
 - Also coursework in the CS department? Bootcamps and summer schools
- **Machine Learning (ML) and Data Science (DS) curriculum from HEP researchers: Recent Examples**
 - APS GDS Initiative
 - CODAS-HEP
 - Savannah’s Princeton [course](#)
- **Opportunities**
 - [What do HEP researchers have to offer for ML/DS Education?](#)
 - [What does ML/DS Education in other fields have to offer HEP research?](#)
 - [Involving early-career researchers in curriculum development and delivery](#)
- **Challenges**
 - [Physics dept. adoption & distinction in the presence of ML courses in CS/DS dept \(Mark’s LOI\)](#)
 - [Diversity, Equity and Inclusion](#)
 - [Academic and career development at the intersection of physics and ML \(Savannah’s LOI\)](#)
 - [Tools and Infrastructure](#)
- **Future Directions**
 - Role of [open data](#)
 - ML/HEP Projects designed around open data
 - Importance of Findable, Accessible, Interoperable, Reusable (FAIR) principles
 - [Coordination / Curation](#)
 - List of courses at the intersection of ML/DS by HEP researchers
 - List of open data
 - List of open software
 - Other resources (training materials, papers, etc)
 - [Tools and Infrastructure](#)