

Summary of CompF03 Machine Learning Working Group



Patrick Komiske



Anja Butter



Andrew Larkoski

Thanks to 6 speakers
for discussions on
diverse topics!



Savannah Thais



Javier Duarte



Dan Guest

Summary of CompF03

Learned in parallel sessions

- Best for you to listen in by yourself :)
 - Recording links for [Day1](#) and [Day2](#)
- Physics-specific Machine Learning ([talk link](#))
 - Reproducibility and public dataset ([CompF07](#)) for a coherent development for shareable, reusable tools/algorithms
 - Data models/structures specific to physics research ([CompF04](#))
- Interface with simulation ([talk link](#))
 - Nice review of how ML used to boost existing event generation workflow, and generative models to the extent of unfolding with LHC example.
 - More ways of simulation and ML interface? **Involve physics frontier liaisons to get more inputs**

Summary of CompF03

Learned in parallel sessions

- Interpretability and validation ([talk link](#))
 - Use domain knowledge to maximize machine performance. Great example: **more survey of instances from physics frontier liaisons?**
 - Look outside HEP for “learning physics from machines” ([CommF groups](#))
- ML community tools ([talk link](#))
 - Many ML packages, options to distribute software environment, and ways to construct training and inference pipeline: deal with caos!
 - Accept evolving ecosystem, avoid mono-culture, and find common standards across experiments: **survey explicitly collaborations through physics frontier liaisons?**

Summary of CompF03

Learned in parallel sessions

- ML resources and management ([talk link](#))
 - Online (fast-ML) and offline (distributed ML etc.), commercial cloud, HPC, grid resources discussed: how do they scale in future?
 - Strong correlation to [CompF01](#) (algo. parallelism) and [CompF04](#) (storage/processing resource access)
- Education and engagement of ML skills ([talk link](#))
 - Education/Career development, outreach/community building, public/benchmark dataset ([CompF7](#)), ethics and safety of AI
 - Large cross-cut with most of [CommF working groups](#) in all aspects above

Summary of CompF03

Next steps

- Within CompF03 group
 - Any missing topic is encouraged to be raised (via email, slack, or through LOI!). Continue discussions on the identified topics in the future meetings
- Within CompF
 - Identified strong overlap with some groups, communicate and move from there to cover the details in depth
- Physics frontiers
 - Several questions raised to survey more input from physics frontiers. Work with Liaisons to understand better the needs!