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## Fast and Robust ML for uncovering BSM physics

*Wednesday 13 March 2024 17:10 (20 minutes)*

Navigating the demanding landscapes of real-time and offline data processing at the Large Hadron Collider (LHC) requires the deployment of fast and robust machine learning (ML) models for advancements in Beyond Standard Model (SM) discovery. This presentation explores recent breakthroughs in this realm, focusing on the use of knowledge distillation to imbue efficient model architectures with essential inductive bias. Additionally, novel techniques in robust multi-background representation learning for detecting out-of-distribution BSM signatures will be discussed, emphasizing the potential of these approaches in propelling discoveries within the challenging LHC environment.

### Significance

Fast and robust ML will be required when analyzing very high data rates in the era of HL-LHC. These techniques will go beyond the conventional tools to address these issues

### References

arXiv:2401.08777, arXiv:2311.17162, and arXiv:2311.14160

### Experiment context, if any

Related to (HL)-LHC experiments

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**Session Classification:** Track 2: Data Analysis - Algorithms and Tools

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