Contribution ID: **254** Type: **Plenary**

Graph Neural Networks and their application in IceCube

Thursday 27 October 2022 09:30 (30 minutes)

The interpretation of detector data to observables that we can use to perform our physics analyses is an essential part in modern day experimental physics. It is also a field among the biggest profiteers in the recent advances of machine learning. In this contribution we want to highlight our event reconstruction efforts using Graph Neural Networks in the IceCube experiment. Using a pulse-based approach our network can adapt to the irregular architecture of our detector. We can show not only speed-ups on the order of magnitudes but also increases in reconstruction resolution of up to 20% compared to our current baseline algorithms. Our goal is to provide an easy-to-use but effective entry into machine learning-based event reconstruction for any physics
purpose: from neutrino oscillations, over beyond-the-standard-model searches, to neutrino astronomy. In addition, our software package is not just compatible with the current IceCube experiment, but also for future extensions, like the IceCube Upgrade or Gen2, as well as any neutrino detector.

Experiment context, if any

References

Significance

Presenter: HAN MINH, Martin

Session Classification: Plenary