ID contributo: **593** Tipo: **Poster**

Machine learning for fast event reconstruction in the SNO+ scintillator phase

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SNO+ is an operational kiloton-scale multipurpose neutrino experiment loaded with linear alkylbenzene-based scintillator. SNO+ analyses have traditionally reconstructed event positions by maximizing a complex likelihood function based on PMT hit times. Machine learning presents an interesting alternative to likelihood for reconstruction problems, being able to learn corrections to averaged PDFs, generalise to tasks for which it is difficult to construct a tractable likelihood function, and make predictions much faster than numerical optimization. Complementary approaches to reconstruction can identify shortcomings in likelihood-based methods and provide a fast seed for likelihood optimization. In this poster we explore applications of machine learning to reconstruction tasks in the SNO+ scintillator, presenting neural network structures that can effectively ingest events consisting of an unordered set of PMT hit information. Applied to the position reconstruction of point-like events, we find some performance gains compared to traditional likelihood optimization while evaluating orders of magnitude faster.

Poster prize

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