

Workshop on Machine Learning for Analysis of High-Energy Cosmic Particles



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Type: **Talk**

Direction and energy reconstruction with uncertainty quantification for GRAND using graph neural network (Remote)

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For experiments such as GRAND, a distributed radio-antenna array for ultra-high-energy neutrino detection, a precise direction and energy reconstruction is essential. Machine-learning methods and in particular graph neural networks (GNN) appear to be an interesting solution given their ability to use localised and variable-size inputs. In this contribution, we will present and summarize the ongoing work within the GRAND collaboration using GNNs in reconstruction efforts, and show that by adding physical inputs to our networks, we achieved better accuracy than existing maximum likelihood methods without increasing the inference time. We also implemented methods to estimate the uncertainty of our predictions under certain conditions.

Type of Contribution

talk

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