

# Classification of KM3NeT online events with ONNX C++ API

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The neutrino telescopes KM3NeT search for cosmic neutrinos from distant astrophysical sources such as supernovae, gamma ray bursters or colliding stars flaring blazars. Once the events are received, they are rapidly reconstructed online. The online events must be classified to identify signal neutrinos from atmospheric muon background events. Dedicated applications will then analyse the neutrino sample to look for correlation with astrophysical sources and so that to send neutrino alerts to the astro community.

The initial pipeline was running the reconstruction in C++ and classifying the events in Python. The classification model has been trained with LightGBM, a gradient boosting framework. To simplify the pipeline, I integrated ONNX Runtime in the reconstruction code. The LightGBM model has been converted in ONNX format. I first compared the results of LightGBM with ONNX runtime in Python. Then, C++ implementation has been done and the new pipeline is now running in production.

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