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GNA: Data Analysis Framework for Neutrino Experiments

Neutrino mysteries are currently under active exploration. There are several experiments aimed to measure parameters with higher precision and shed light on unresolved issues in this area. Precision measurement requires accurate data analysis.
GNA framework is developed to provide an efficient and easy for the end-user way to implement own data analysis. While being easy to configure, the framework enables user to build comprehensive models with large number of parameters. GNA computational process is represented by graph consisting of separate transformations (functions). Transformations are isolated from each other and interact through its interfaces only. Transformations perform the computations based on input data and provide the output data for the following transformations thus implementing the analysis chain. The particular attention is also paid to achieving computational efficiency. Such features as lazy evaluation and well-optimized mathematical libraries are used to achieve that.
The framework is used by JUNO and Daya Bay collaborations and expected to be used for for similar data analysis problems.

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