Tagging large-radius *b*-jets from Higgs decays dropping unneeded information A.Di Luca, D. Mascione, F.M. Follega, M.Cristoforetti, R.Iuppa - PANIC 2021 Poster Session

jet (anti-kT jet with R = 1) with the 2 variable

contained in the large radius jet with highest p_{τ} .

boosted H decay.

Dataset

INTRODUCTION

Among the high-energy physics community, there is a growing interest in replacing cut-based selections using different types of multivariate analysis.

Deep Learning approaches are rapidly spreading to improve the selection performances by combining all the available information. The development of these algorithms often relies on a brute force approach where all available event features are tested for multiple combinations of the algorithm hyperparameters.

We propose an effective method that, using a CancelOut layer, selects at training time a fixed number of most relevant features in a Deep Neural Network classifier.

BENCHMARK APPLICATION



CANCELOUT LAYER

CancelOut layer can rank relative importance among features in input to a Deep Neural Network at training time.

We developed an ad hoc loss function to activate only a certain number (defined by the user) of features having under control the performances.







CancelOut weights are well behaved when increasing the required number of input feature.

RESULTS



After a certain number of features are activated, there is no significant improvement in the performance.