Differentiable Vertex Fitting for Jet Flavour Tagging

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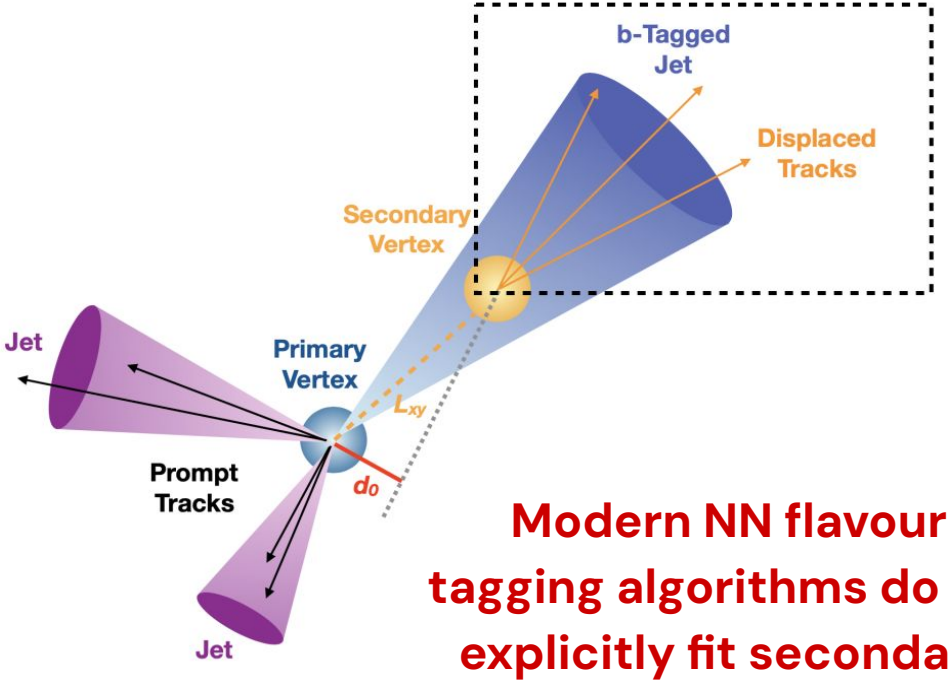
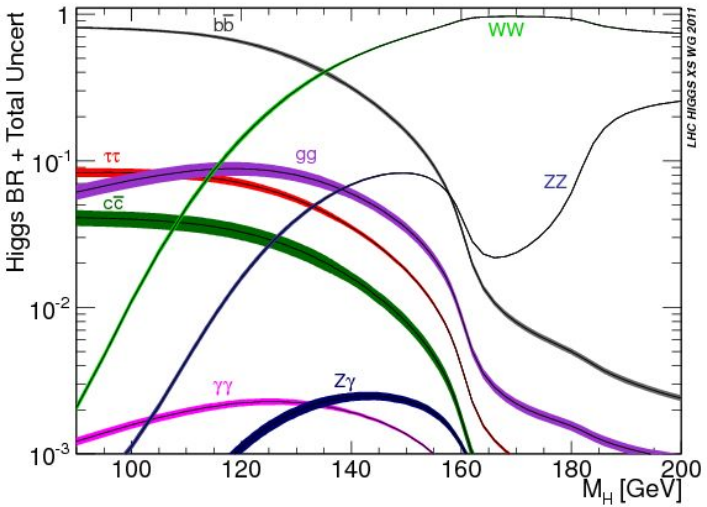
Jet flavour tagging in high energy physics

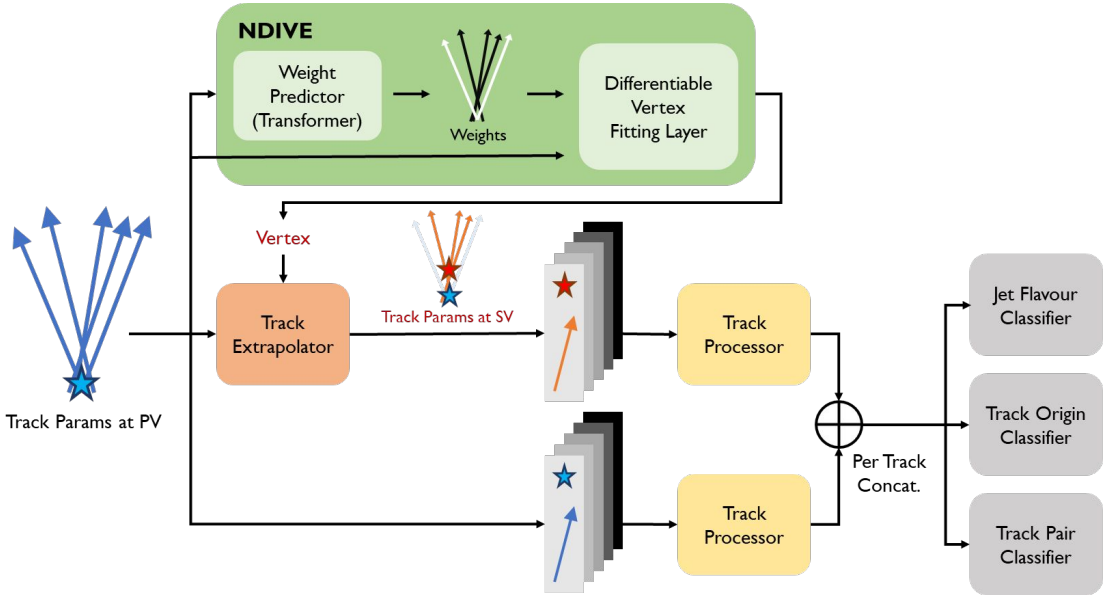


Modern NN flavour tagging algorithms do not explicitly fit secondary vertices…

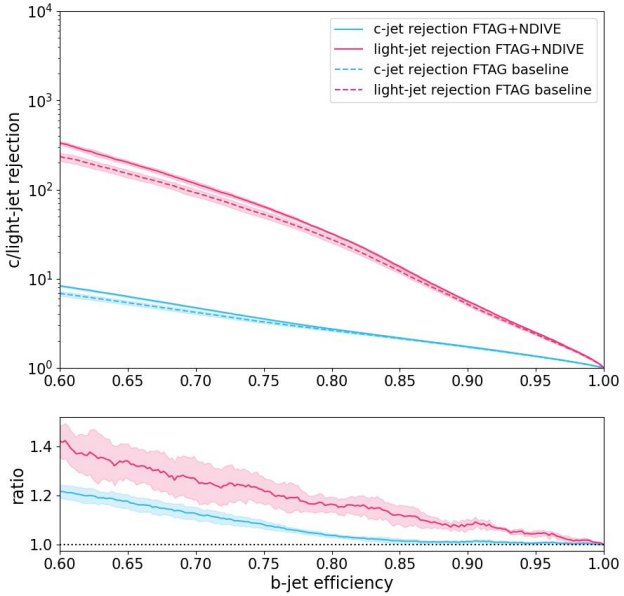
Standard Model Higgs boson decays preferentially to a pair of b-quarks



NDIVE (Neural DIfferentiable VErtexer)



NDIVE integration into NN flavour tagging model improves performance:

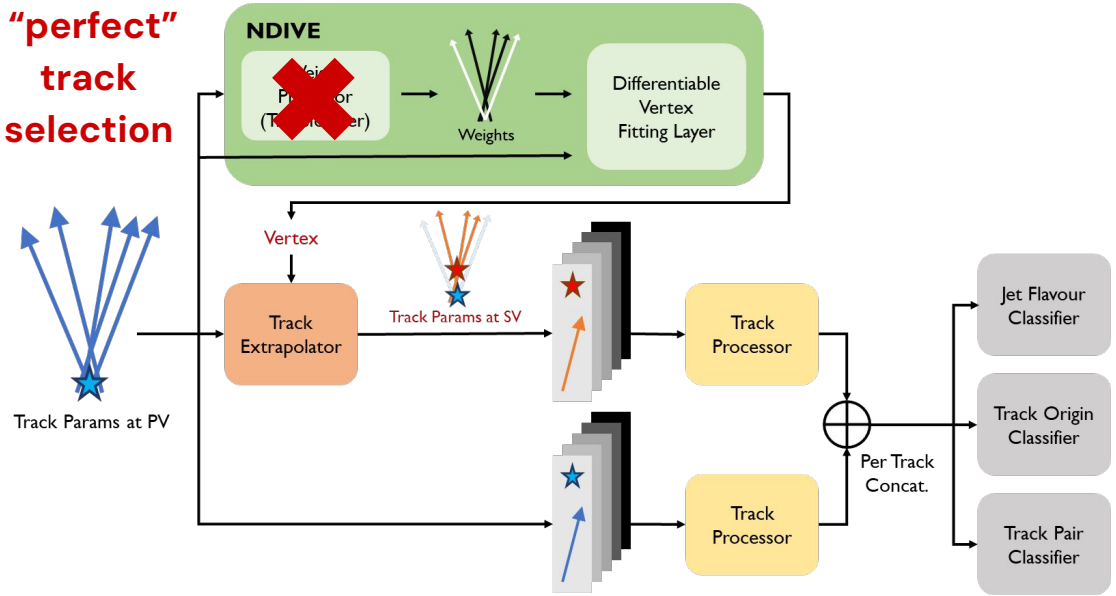


fully integrated and jointly optimizable;

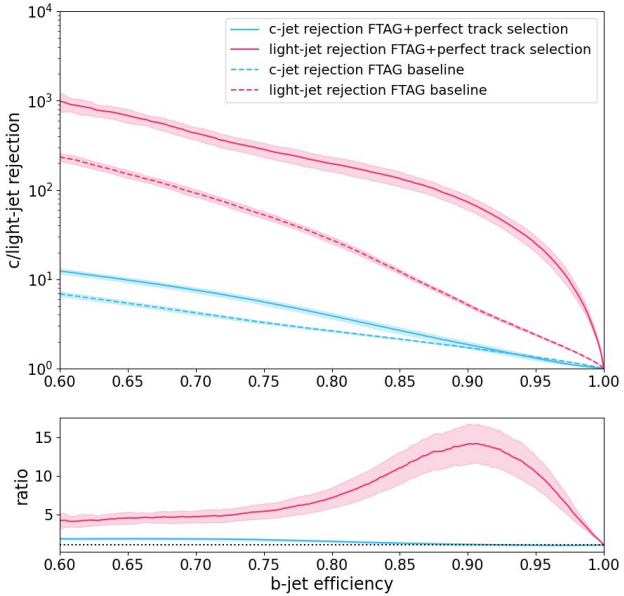
explicitly introduce physics knowledge into NNs!

NDIVE (Neural DIfferentiable VErtexer)

"perfect" track selection



NDIVE integration into NN flavour tagging model improves performance:



Significant improvements possible with better track selection!