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Finetuning Foundation Models for Joint Analysis Optimization

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In this work we demonstrate that significant gains in performance and data efficiency can be achieved moving beyond the standard paradigm of sequential optimization in High Energy Physics (HEP). We conceptually connect HEP reconstruction and analysis to modern machine learning workflows such as pretraining, finetuning, domain adaptation and high-dimensional embedding spaces and quantify the gains in the example usecase of searches of heavy resonances decaying via an intermediate di-Higgs to four b-jets.

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