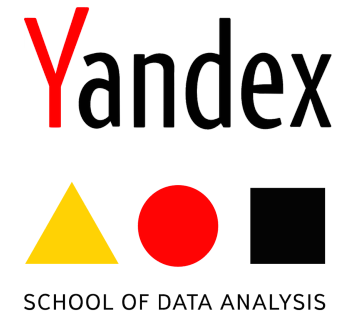


MLHEP challenges

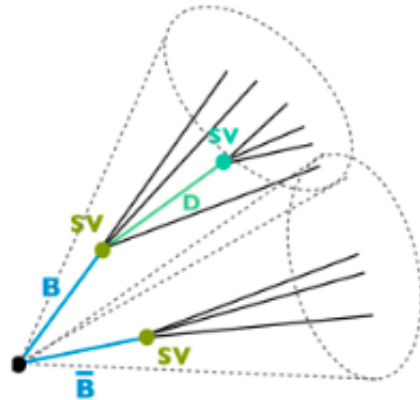
Alex Rogozhnikov & Tatiana Likhomanenko

Lund, MLHEP 2016



Trigger System

Competition for advanced track



Goal

The system which defines "interesting" events is called trigger system and works online. This is the first stage of selecting event for further analysis.

In this competition you should build a trigger system which efficiently selects events.

Timeline: till 22 Jun (3 days!).

Data description

- For each event you're provided with a set of its secondary vertices.
- Predict whether an event should be stored.
- Train dataset has additional information: weights and decay family.

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More details in Tatiana's today slides.

Evaluation

- The metric evaluated (and displayed on the leaderboard) is ROC AUC (area under the ROC curve), which was introduced during the lectures.
- Test data is split into two parts:
 - public leaderboard (shown)
 - private leaderboard (final standings)

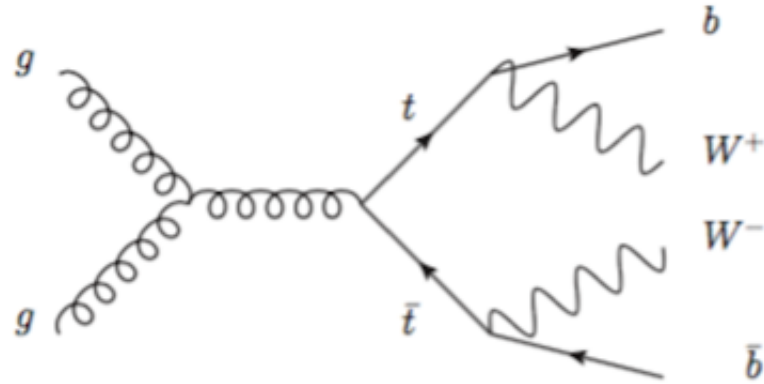
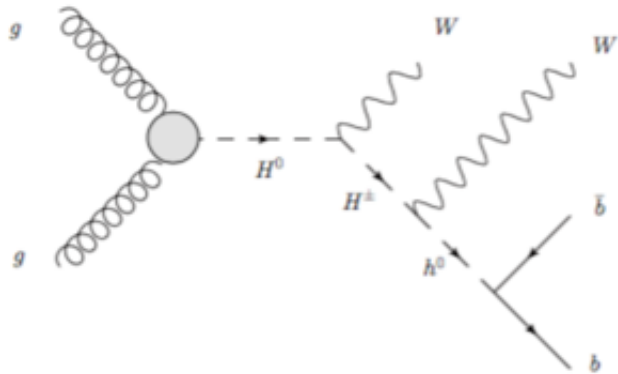
Exotic Higgs Boson Challenge

Competition for both tracks of MLHEP 2016



Goal of the Challenge

discriminate two kinds of processes that possibly could be studied at the LHC.



Timeline: till 26 Jun

Data description

Dataset consists of 21 low-level features and 7 high-level features.

- low-level features are momenta:
 - lepton momentum
 - momenta and b-tags of 4 jets
 - missing transverse momentum
- high-level features are invariant masses
- feature named 'target' is present only in training. 1 corresponds to signal (Higgs) decay, 0 to background

Evaluation

same as in 'Triggers': ROC AUC.

Evaluation

same as in 'Triggers': ROC AUC.

Rules of the competitions

- You can participate in teams of two (for triggers: max one physicist in a team)
- Important part of educational process
- Code sharing between teams shall be done publicly (through the [chat](#))
- Students from advanced track should focus on 'Trigger' challenge.

Acknowledgements

We thank Mike Williams and Philip Iten for help in preparing toy dataset for 'trigger' challenge.

We are grateful to P. Baldi, P. Sadowski, and D. Whiteson for publishing original dataset and helping to prepare the data for 'Higgs' challenge.

(please note that this datasets are different compared to original papers, so obtained results can't be compared)